

Original Research

Food Consumption Patterns of Infants and Toddlers: Where Are We Now?

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ABSTRACT

Objectives To describe current infant-feeding practices and current food group consumption patterns of infants and toddlers and to compare 2008 data with 2002 data to identify shifts in these practices and food consumption over time.

Design The Feeding Infants and Toddlers Study (FITS) 2008 is a cross-sectional survey of a national random sample of US children from birth up to age 4 years. Data for three age subgroups (infants 4 to 5.9 months and 6 to 11.9 months and toddlers 12 to 23.9 months) were used from the 2002 (n=2,884) and 2008 surveys (n=1,596).

Statistical methods All analyses use sample weights that reflect the US population aged 4 to 24 months. Descriptive statistics (means, proportions, and standard errors) and *t* tests were calculated using SUDAAN (release 9, 2005, Research Triangle Park Institute, Research Triangle Park, NC).

Results These data show a higher percentage of infants receiving breast milk from 4 to 11.9 months of age with a concurrent decreasing percentage of infants receiving formula, which is significantly different from data for the 9- to 11.9-month-old age group. The use of complementary foods also appears to be delayed in FITS 2008: There is a significantly lower proportion of infants consuming infant cereal at 9 to 11.9 months in FITS 2008 compared to 2002 data. Fruit and vegetable consumption remains lower than desired. Significant reductions in the percentage of infants

and toddlers consuming any desserts or candy, sweetened beverages, and salty snacks were seen in 2008.

Conclusions The findings presented here provide important insights to the content of messages and types of interventions that are still needed to improve the diets of infants and toddlers.

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Improper early childhood feeding, including issues related to the duration of breastfeeding, use and quantity of human milk substitutes, and timing and introduction of complementary foods, has been linked with overall dietary nutrient inadequacy and suboptimal childhood growth and development (1-3). Of particular public health concern today is the dietary and physical activity or inactivity behaviors of infants and toddlers that are contributing to the high prevalence of childhood obesity (4). The most recent National Health and Nutrition Examination Survey data (2007-2008) indicate that 9.5% of infants and toddlers were \geq 95th percentile of weight for length; an estimate that has remained relatively stable since 1999 (5).

Few studies have been conducted on a large, national sample that can contribute to our understanding of the parental behaviors potentially leading to this early childhood obesity. The previous Feeding Infants and Toddlers Study (FITS), conducted in 2002 on a national random sample, was instrumental in documenting the feeding patterns of children aged 4 to 24 months and how they compared to established guidelines (6,7). These data provided incredible insights into some of the problems that may be contributing to the increased rates of obesity at an early age, such as the early introduction of foods during infancy that are high in fat, sugar, and sodium (6). With the completion of yet another survey conducted in 2008, we have the opportunity to explore changes in the feeding patterns and food consumption of this age group between 2002 and 2008. Thus, the purpose of this article is to describe the current infant-feeding practices in terms of breastfeeding and use of human milk substitutes as well as the introduction of complementary foods among infants participating in FITS 2008, describe food group consumption patterns of infants and toddlers, and compare the 2008 with the 2002 FITS data to identify shifts in these practices and food consumption over time.

METHODS

Study Design and Response Rates

FITS 2008 is a cross-sectional survey of a national random sample of US children from birth through age 47 months, similar to that conducted in 2002 (8). The recruitment of

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Table 1. Comparison of characteristics of the dietary interview sample in the Feeding Infants and Toddlers Study (FITS) 2002 and 2008 for ages 4 to 23.9 months weighted to be nationally representative

Characteristic	FITS 2002		FITS 2008	
	Percent	Standard error	Percent	Standard error
Child's sex				
Male	52.4	1.2	50.5	2.0
Child's race/ethnicity^{***}				
Non-Hispanic white	73.1	0.8	54.7**	1.6
Non-Hispanic black	6.7	0.6	13.8**	1.0
Hispanic	12.3	0.8	22.6**	1.6
Other	7.9	0.2	8.9	0.9
Child receives WIC^b	25.3	1.0	36.7**	1.9
Attends child care	46.7	1.2	43.3	2.0
Age of mother at birth (y)^a				
<14	0	—	0.2	0.2
14-19	3.9	0.5	5.4	1.0
20-24	18.3	0.9	15.5	1.9
25-29	27.6	1.1	33.0*	2.4
30-34	29.7	1.1	25.4	2.4
35-39	15.9	0.9	16.0	2.1
≥40	4.7	0.5	4.6	0.9
Mother's education^{acd}				
≤9th grade	1.9	0.4	2.9**	1.1
10 th -11th grade	4.7	0.5	3.4**	0.7
Completed high school	25.2	1.1	22.1**	1.8
Some post secondary	28.0	1.1	30.6**	1.9
Completed college	26.7	1.1	23.7**	1.8
Some graduate work/degree	13.3	0.8	17.2**	1.5
Parents' marital status^{***}				
Married	82.4	0.9	76.3**	1.7
Separated or divorced	2.7	0.4	4.0	1.0
Widowed	0.1	0.0	0.3	0.2
Not married	8.9	0.7	11.6	1.2
Partners living together	6.0	0.6	7.8	1.1
Mother works	57.2	1.2	50.6**	2.1
Household income^{ae**}				
<\$10,000	1.5	0.3	5.3**	0.9
\$10,000-\$14,999 ^e	1.6	0.3	N/A ^f	N/A
\$10,000-\$19,999 ^e	N/A	N/A	6.3	0.9
\$15,000-\$24,999 ^{eg}	7.8	0.7	N/A	N/A
\$20,000-\$34,999 ^e	N/A	N/A	14.1	1.4
\$25,000-\$34,999 ^e	11.6	0.8	N/A	N/A
\$35,000-\$49,999	24.3	1.1	14.7**	1.5
\$50,000-\$74,999 ^g	19.9	1.0	20.5	1.5
\$75,000-\$99,999	9.5	0.7	14.4**	1.4
≥\$100,000	8.7	0.7	13.7**	1.3
Missing (not reported)	14.4	0.6	11.1	1.5

^aDifferences in the overall distribution were tested using χ^2 . Differences for each individual row were tested using a *t*-test for difference in means.

^bWIC=Special Supplemental Nutrition Program for Women, Infants, and Children.

^cHighest year or grade of school completed. Special education applied to 0.2% in 2002 and 0.1% in 2008.

^dIncludes biological and adoptive mothers. Includes primary female caretaker in 2002.

^eLower income categories varied slightly between FITS 2002 and FITS 2008 and are shown on separate lines. There was no significant difference between FITS 2002 and FITS 2008 in the combined income category \$10,000-\$34,999.

^fN/A=not available.

^gIn FITS 2002, two other income categories were allowed and accounted for 0.4% each; responses were assigned to the midpoint of the range (ie, '<\$35,000 was included in '\$15,000-\$24,999' and '\$35,000-\$99,000' was included in '\$50,000-\$74,999').

**P*<0.05 (no adjustments are made for multiple comparisons).

***P*<0.01 (no adjustments are made for multiple comparisons).

Table 2. Percentage of infants and toddlers consuming different types of milk in the Feeding Infants and Toddlers Study 2008 and 2002

Food group/food	Year	Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age (mo)						
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		<i>mean ± standard error</i>						
Breast milk	2008	42.2±5.1	33.2±5.1	33±5.0*	13.9±2.9	4.4±1.4 ^a	1.2±0.4	5.6±2.3 ^a
	2002	39.8±2.4	27.6±1.9	21±1.9	13.7±2.0	3.6±1.3 ^a	3.9±1.4	5.9±2.3 ^a
Formula	2008	65.3±5.0	74.5±5.0	63.8±5.0*	24.4±4.5	7.1±3.0 ^a	1.4±0.9 ^a	1.3±0.8 ^a
	2002	73.4±2.6	81.4±1.6	75.9±1.9	22.0±2.5	5.1±1.7 ^a	2.3±1.1 ^a	1.7±1.0 ^a
Cow's milk (all types)	2008	0 ^a	5.3±2.6 ^a	16.6±4.2	70.2±4.7**	85.6±3.6	87.4±3.0	87.7±3.7
	2002	0.1±0.1 ^a	2.7±0.7 ^a	18.4±1.7	83.7±2.1	87.3±2.4	89.9±2.5 ^a	85.9±2.8
Soy milk/rice milk	2008	0 ^a	0	0.2±0.2 ^{a*}	3.2±1.9 ^a	6.0±2.0 ^a	4.8±1.8 ^a	1.4±0.6 ^a
	2002	0 ^a	0.3±0.2 ^a	1.7±0.6 ^a	1.5±0.6 ^a	4.8±1.4 ^a	3.1±1.6 ^a	3.7±1.3 ^a

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

*Mean between 2002 and 2002 significantly different at $P < 0.05$.

**Mean between 2002 and 2002 significantly different at $P < 0.01$.

subjects, the sampling frame, sample characteristics, and data collection and quality assurance procedures are described in detail by Briefel and colleagues elsewhere in this supplement (see pages S16-S26) (9). All instruments and procedures were reviewed and approved by Mathematica Policy Research's independent institutional review board (Public/Private Ventures, Philadelphia, PA).

Among sampled households that could be reached to verify an age-eligible child, 60% responded to the recruitment interview. Among respondents who completed the recruitment interview, 78% completed a 24-hour dietary recall. The overall analytic response rate among those located with an eligible child is 47% ($0.60 \times 0.78 = 0.47$) (9). This response rate is comparable to what other large-scale telephone surveys in the past decade have experienced (10-12). Data are weighted to account for nonresponse and undercoverage of some subgroups of children not included in the sample frame and to reflect the US population.

Sample

This article broadly focuses on three age subgroups using data from both the 2002 ($n=2,884$) and 2008 surveys ($n=1,596$). In 2002 and 2008 there were 486 and 166 infants 4 to 5.9 months (meaning up to age 6 months), respectively; 1,395 and 505 older infants aged 6 to 11.9 months, respectively; and 1,003 and 925 toddlers aged 12 to 23.9 months, respectively.

Data Collection Methods and Outcome Measures

Similar to the 2002 data collection methods (13), study participants received up to three telephone interviews between June 2008 to January 2009: a recruitment interview to determine whether there was an age-eligible child and to collect household and child characteristics, including child feeding patterns; a dietary interview, including a 24-hour dietary recall and questions on breastfeeding, and the introduction of foods; and a second 24-hour dietary recall 3 to 10 days following the first recall (on a subsample for the estimation of usual intake distribu-

tions). Before the dietary interview, respondents (the primary caretaker of the selected child, typically the mother) were mailed a packet of materials, including a study letter, food model booklet, ruler, liquid measuring cup with instructions, and instructions for foods consumed while the child was in child care (see reference [9] for details on data collection methods and quality control).

Dietary interviews were administered by certified dietary interviewers at the University of Minnesota's Nutrition Coordinating Center by telephone using the FITS 2008 protocol and the Nutrition Data System for Research (NDSR) (version 2008, University of Minnesota Nutrition Data System for Research, Minneapolis). All study materials were available in English and Spanish. Respondents received a \$20 incentive for participation in the first dietary interview and an additional \$10 for the second 24-hour dietary recall. Approximately 26% of the dietary recalls were collected for weekend intakes (ie, Saturday or Sunday) and 74% reflected intake on weekdays (ie, Monday through Friday).

Foods Database

The NDSR 2008 includes more than 18,000 foods with values for 156 nutrients, nutrient ratios, and other food components. This database contains more than 7,000 brand-name products, including many baby/toddler foods and infant formulas. When a reported food was not available in the database, the item was entered as "missing" along with details (brand name, description, preparation details, package size, dimensions, and weight or number consumed) and resolved after data entry was completed for the recall. A total of 358 foods were added to the FITS 2008 database.

All foods and beverages reported in the 24-hour dietary recalls were assigned by Mathematica nutrition researchers to food groups in a manner consistent with those used for the food group analysis in the 2002 FITS (6). The 2002 food groups were updated and expanded, as needed, to incorporate new foods and beverages reported in the

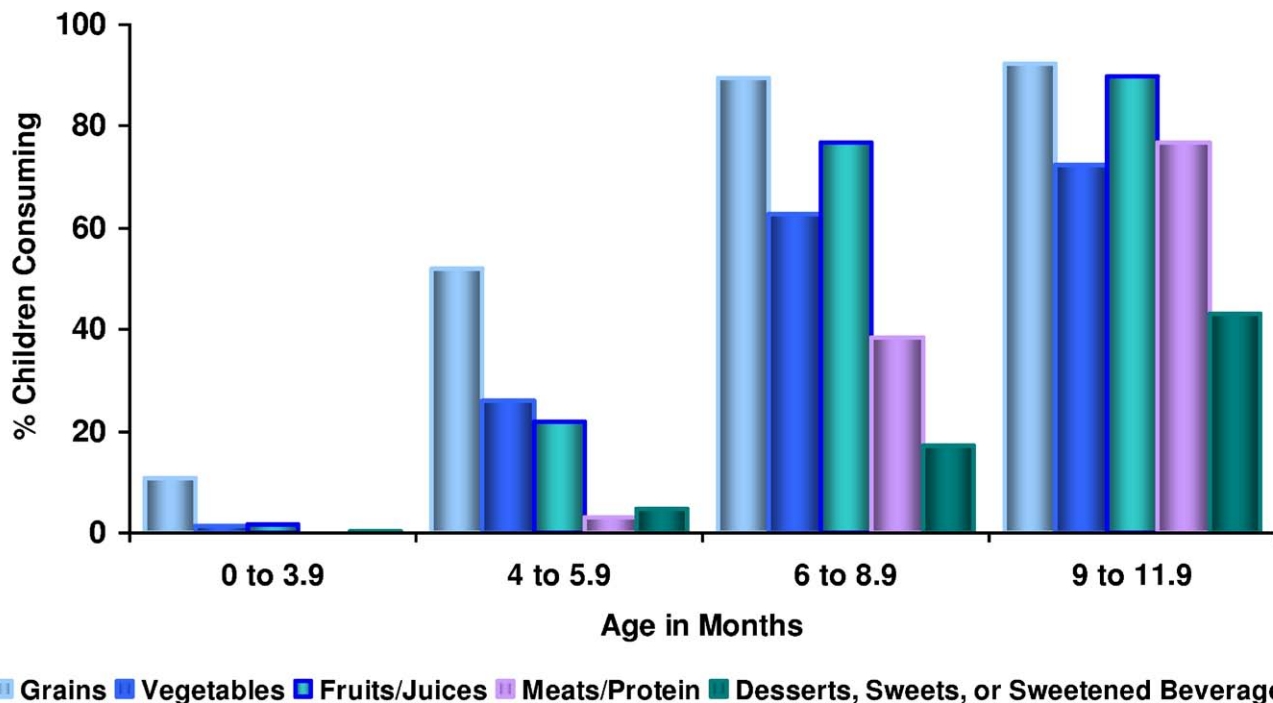


Figure 1. Percentage of children consuming any complementary foods by age groupings in the first year of life in the Feeding Infants and Toddlers Study 2008. Boxes in various shades represent the different food groups.

FITS 2008 and to address the research objectives on consumption of foods and food groups/subgroups.

We used the food group data to calculate the percentage of children who consumed specific foods or food groups at least once in a day. One-day estimates from 24-hour recalls for the purpose of estimating group means has been previously shown to be appropriate (14). All reported foods and beverages are included in the estimates, regardless of the amount consumed. Estimates are based on foods as consumed; that is, food mixtures, such as soups, pizza, or pasta-based dishes, are considered single items and were not broken down into their constituent ingredients. In this manner the estimates of the percentages of infants and toddlers consuming vegetables and fruits should be considered as lower-bound estimates.

Statistical Analysis

Sample weights were calculated to account for nonresponse and to weight the sample to known population demographic characteristics. All analyses use sample weights that reflect the US population for the appropriate ages and survey year. All estimates (eg, means and proportions) were calculated using the Statistical Analysis System (version 9.1.3, 2004, SAS Institute, Cary, NC) and accounted for the weighting and design effects. Standard errors, χ^2 , and *t* tests were calculated using SUDAAN (release 9, 2005, Research Triangle Institute, Research Triangle Park, NC). We denote significance using *P* values <0.05 and 0.01. We did not adjust for multiple comparisons since the rationale was to identify differences that may be meaningful for further exploration and confirmation in other studies (15).

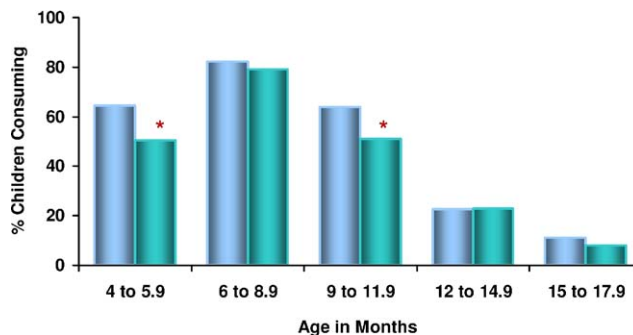


Figure 2. Percentage of children consuming infant cereals by age groupings in the Feeding Infants and Toddlers Study (FITS) 2002 and 2008. Blue bars represent FITS 2002 data and green bars represent FITS 2008. *Statistically different by year, at *P*<0.05.

RESULTS

Population Characteristics

Characteristics of the child, mother, and household for each survey weighted to the US population are shown in Table 1. There were similar distributions of child's sex, attendance at out-of-home child care, mother's age, and education in each survey year. Compared to the 2002 population, in 2008 there was a higher proportion of Hispanics and non-Hispanic blacks, a higher proportion of children participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), a lower proportion of parents married, more mothers working, and a higher proportion of families with household incomes in the upper categories.

Table 3. Percentage of infants and toddlers consuming different types of grain products in the Feeding Infants and Toddlers Study 2008 and 2002

		Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age						
Food group/food	Year	6-11 mo			12-23 mo			
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		← mean ± standard error →						
Any grain or grain product	2008	52.5 ± 5.1*	89.4 ± 2.5	92.2 ± 2.6 ^{a*}	99.2 ± 0.3 ^a	97.7 ± 1.6 ^a	98.9 ± 0.9 ^a	99.1 ± 0.6 ^a
	2002	65.2 ± 2.3	89.8 ± 1.2	97.5 ± 0.6 ^a	97.5 ± 0.9 ^a	98.9 ± 0.8 ^a	99.1 ± 0.9 ^a	99.3 ± 0.3 ^a
Infant cereals	2008	50.4 ± 5.1	79.1 ± 3.5	51 ± 5.0*	22.9 ± 4.5	8 ± 12.1 ^a	3.6 ± 1.2 ^a	5.4 ± 4.2 ^a
	2002	64.5 ± 2.4	82.1 ± 1.6	63.8 ± 2.1	22.6 ± 2.4	11.1 ± 2.3	1.7 ± 1.0	2.4 ± 1.3
Noninfant cereals ^b	2008	0.1 ± 0.1 ^a	7.7 ± 2.2 ^a	42.6 ± 5.0	62.5 ± 5.0	59.4 ± 4.8	61.7 ± 5.4	54.7 ± 5.9
	2002	0.6 ± 0.4 ^a	12.4 ± 1.4	43.4 ± 2.2	59.4 ± 2.9	58.8 ± 3.5	56.7 ± 4.1	53.8 ± 4.3
Presweetened ^c	2008	0 ^a	1 ± 0.7 ^a	8 ± 3.5 ^a	19.1 ± 3.2	26.7 ± 5.2	21.9 ± 4.0	30 ± 4.6
	2002	0 ^a	1.2 ± 0.4 ^a	8.9 ± 1.3	17.1 ± 2.2	24.8 ± 3.1	25.2 ± 3.4	25.1 ± 3.8
Not presweetened	2008	0.1 ± 0.1 ^a	7.4 ± 2.2	35.9 ± 4.6	47.4 ± 4.9	39.1 ± 4.8	41.3 ± 5.5	30 ± 4.9
	2002	0.3 ± 0.2 ^a	11.5 ± 1.3	36.2 ± 0.2.1	45.7 ± 3.0	40.8 ± 3.5	35.2 ± 3.8	31.4 ± 4.1
Bread and rolls ^{de}	2008	0 ^a	2.6 ± 0.9 ^{a**}	14.3 ± 3.1	26.5 ± 4.0*	31.7 ± 4.6	35.3 ± 5.3*	53.7 ± 5.5*
	2002	0.3 ± 0.3 ^a	7.2 ± 1.1	21.1 ± 1.8	38.8 ± 2.9	41.6 ± 3.5	48.6 ± 4.1	38.7 ± 4.2
Crackers, pretzels, rice cakes	2008	0 ^{a*}	20.4 ± 2.4	44.5 ± 4.8	46.7 ± 4.7	42.3 ± 4.8	44.7 ± 5.3	45.7 ± 5.6
	2002	1.1 ± 0.5 ^a	12.9 ± 1.3	34.7 ± 2.1	46 ± 3.0	47.9 ± 3.5	43.8 ± 4.0	46.3 ± 4.3
Cereal or granola bars	2008	0 ^a	0 ^{a*}	1.4 ± 0.6 ^a	8.7 ± 2.8	7.3 ± 2.2 ^a	7.4 ± 2.2 ^a	8.9 ± 2.3 ^a
	2002	0 ^a	0.8 ± 0.4 ^a	3.2 ± 0.7	9.6 ± 1.7	10.7 ± 2.2	8.6 ± 2.5 ^a	10.7 ± 2.8 ^a
Pancakes, waffles, french toast	2008	0 ^a	1.2 ± 0.6 ^a	5.8 ± 2.1 ^a	13.5 ± 3.5	15.5 ± 3.6	13.3 ± 4.4	21.9 ± 5.7
	2002	0.2 ± 0.2 ^a	0.5 ± 0.3 ^a	7.4 ± 1.2	14.7 ± 1.2	15.2 ± 2.4	16.7 ± 3.1	13.4 ± 2.7
Rice and pasta ^f	2008	1.4 ± 1.4 ^a	3.2 ± 1.5 ^a	15.3 ± 4.0	23.3 ± 4.1	32.6 ± 5.2	37.1 ± 5.4	31.3 ± 5.9
	2002	0 ^a	4.7 ± 0.9	17 ± 1.6	23.9 ± 2.5	34.9 ± 3.4	34.1 ± 3.9	35.6 ± 4.1
Grains in mixed dishes^g	2008	0 ^a	2.4 ± 1.0 ^a	18.5 ± 3.5	46.2 ± 4.8*	62 ± 5.2*	56.3 ± 5.5	64.2 ± 5.4
	2002	0.2 ± 0.2	3.9 ± 0.9	23 ± 1.9	48.3 ± 3.0	49.2 ± 3.5	56.7 ± 4.1	56.3 ± 4.3
Sandwiches	2008	0 ^a	0 ^a	5.8 ± 2.2 ^a	20.5 ± 3.7	19.1 ± 3.6	27.4 ± 5.1	19.3 ± 3.8
	2002	0 ^a	0.8 ± 0.4 ^a	8.3 ± 1.3	20.7 ± 2.5	24.3 ± 3.0	29.4 ± 3.7	22.8 ± 3.5
Burrito, taco, enchilada, nachos	2008	0 ^a	0 ^a	0.9 ± 0.6 ^a	2 ± 0.9 ^a	2.3 ± 1.3 ^a	2.5 ± 1.7 ^a	3.4 ± 1.4
	2002	0 ^a	0 ^a	1 ± 0.4 ^a	3.7 ± 1.4 ^a	3.7 ± 1.4 ^a	2.7 ± 1.1 ^a	2.1 ± 1.1
Macaroni and cheese	2008	0 ^a	1.8 ± 0.9 ^a	5.3 ± 2.0 ^a	9.2 ± 1.9	18 ± 3.8	13.1 ± 2.5	15.2 ± 4.0
	2002	0 ^a	1.3 ± 0.5 ^a	4.8 ± 0.9	14.4 ± 2.1	15.1 ± 2.5	14 ± 2.8	16.4 ± 3.4
Pizza	2008	0 ^a	0 ^a	2.1 ± 1.0 ^a	5 ± 1.6 ^a	15.2 ± 4.4	5.3 ± 1.9 ^a	12.4 ± 4.7
	2002	0.2 ± 0.2 ^a	0.5 ± 0.4 ^a	2.2 ± 0.7 ^a	6.7 ± 1.6	6.7 ± 1.7 ^a	8.9 ± 2.1 ^a	13 ± 3.0
Pot pie/stuffed sandwich	2008	0 ^a	0 ^a	0.4 ± 0.4 ^a	0.2 ± 0.2 ^a	0.9 ± 0.5 ^a	1 ± 0.9 ^a	0.4 ± 0.3 ^a
	2002	0 ^a	0.6 ± 0.4 ^a	0.5 ± 0.3 ^a	2 ± 1.0 ^a	1.4 ± 0.8 ^a	0 ± 0.0 ^a	1.6 ± 0.8 ^a
Spaghetti, ravioli, lasagna	2008	0 ^a	0.9 ± 0.5 ^a	7.7 ± 2.2 ^a	18 ± 3.3	22 ± 4.3*	17.2 ± 4.0	23.5 ± 5.0**
	2002	0 ^a	1.3 ± 0.5 ^a	9 ± 1.4	16.4 ± 2.3	11.9 ± 2.4	11.3 ± 2.6	8.7 ± 2.2 ^a
Sample size	2008	166	249	256	243	251	219	212
	2002	486	708	687	371	239	189	168

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

^bIncludes both ready-to-eat and cooked cereals.

^cDefined as cereals with more than 21.2 g sugar per 100 g.

^dAlso includes biscuits, bagels, and tortillas.

^eDoes not include bread and rolls in sandwiches. Sandwiches are included in mixed dishes.

^fDoes not include rice or pasta in mixed dishes.

^gIncludes dishes that are primarily grain; other mixed dishes that include grain in combination with protein and/or vegetables are reported elsewhere.

*Means between 2008 and 2002 significantly different at $P < 0.05$.

**Means between 2008 and 2002 significantly different at $P < 0.01$.

Infant Feeding Practices

Rates for infants being ever breastfed remained high in 2008 (79.5% ± 1.5%, and 76.2 ± 1.1 in 2002; $P = 0.07$). The percentage of infants currently breast-feeding was significantly higher for infants aged 4 to

5.9 months in 2008 (42.5% ± 5.1%) than in 2002 (26.2% ± 2.2%) ($P < 0.01$) as well as for those aged 9 to 11.9 months (36.7% ± 5.0% vs 20.9% ± 1.9% in 2008 and 2002 respectively), and reached borderline significance for infants aged 6 to 8.9 months (37.3% ± 5.4% vs

Table 4. Percentage of infants and toddlers consuming different types of fruit in the Feeding Infants and Toddlers Study 2008 and 2002

Food group/food	Year	Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age (mo)						
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		<i>mean ± standard error</i>						
Any fruit or juice	2008	21.8±3.9**	76.9±3.6*	89.8±2.5	90.2±2.4	86.9±3.7	92.1±2.4 ^a	92.8±2.0 ^a
	2002	43.9±2.5	84.7±1.5	89±1.4	91.1±1.6	88.6±2.3	86.3±2.9	86.7±3.1
Any fruit	2008	18.5±3.6**	64.5±5.1	80.6±4.0	74.3±4.2	74.7±4.5	84±3.0**	73.4±4.6
	2002	36.5±2.4	73.5±1.8	76.1±1.9	75.9±2.5	72.4±3.2	70±3.8	65.4±4.2
Baby food fruit	2008	16.8±3.5**	50.2±5.4**	42.4±4.9	15.9±3.7	8.6±2.4	10.3±3.4*	2.1±1.0 ^a
	2002	34.8±2.4	66.4±2.0	45.3±2.2	16.5±2.1	6.3±1.7 ^a	2.2±1.3 ^a	1±0.7 ^a
Non-baby food fruit	2008	1.7±0.8 ^a	21.2±5.2	51±5.0	68.8±4.4	71.9±4.5	80.8±3.3*	72.2±4.6
	2002	3.1±0.9 ^a	13.7±1.4	43.3±2.2	66±2.8	68.7±3.3	69.8±3.8	64.8±4.2
100% fruit juice	2008	7.1±2.3 ^{***}	31.2±5.6*	40.9±4.8**	55±4.8	51.8±5.2	54±5.4	60.9±5.7
	2002	18.7±2.0	43.4±2.1	58±2.1	58.9±2.9	62.1±3.4	61.8±4.0	67.4±4.0
Types of non-baby food fruit								
Canned fruit	2008	1.2±0.7 ^a	4.1±1.4 ^a	18.6±4.0	31.4±4.5	27.1±3.9	31.1±5.3	29.8±5.5
	2002	1.3±0.6 ^a	4.7±0.8	20.9±1.8	31.8±2.8	24.3±3.0	24.2±3.4	19.6±3.2
Sweetened or packed in syrup	2008	0 ^a	1.2±0.7 ^a	7.4±3.3 ^a	10.9±2.4	9.1±2.2	14.4±4.5	14.7±5.2
	2002	0.9±0.6 ^a	0.5±0.3 ^a	8±1.2	15.1±2.2	13.2±2.4	9.9±2.3 ^a	8.4±2.1 ^a
Unsweetened or packed in juice or water	2008	1±0.7 ^a	2.4±1.1 ^a	10.4±2.7	18.8±4.4	17.1±3.5	13.8±3.7	11.1±2.6
	2002	0.3±0.2 ^a	3.7±0.8	12.9±1.5	18±2.4	10.4±2.0	12.3±2.6	11.2±2.7 ^a
Unknown pack	2008	0.2±0.2 ^a	0.5±0.5 ^a	1.9±1.2 ^a	3.9±1.5 ^a	2.8±0.9 ^a	3.4±1.6 ^a	4.2±1.5 ^{*,a}
	2002	0 ^a	0.5±0.2 ^a	1.3±0.4 ^a	1.2±0.5 ^a	2.5±1.0 ^a	3.4±1.3 ^a	0.4±0.4 ^a
Fresh or frozen fruit	2008	0.8±0.4 ^a	18.4±5.2	37±5.0	54.1±4.8	61.3±4.7	59±5.1	56.1±5.8
	2002	2.2±0.7 ^a	9.8±1.3	27.9±2.0	50.8±3.0	55.7±3.5	54.6±4.1	49.9±4.3
Dried fruit	2008	0 ^a	0 ^a	1.7±0.8 ^a	6.5±2.9 ^a	6.7±3.1 ^a	9.6±3.4	6.6±2.0 ^a
	2002	0 ^a	0.3±0.3 ^a	2±0.6 ^a	3.6±1.1 ^a	6.3±1.7 ^a	7.3±1.8 ^a	12.3±2.7 ^a
Types of fruit^b								
Apples	2008	7.2±2.5 ^{***}	27.9±5.2	32.5±4.5	25.9±4.4	32.1±4.8*	28.6±4.6	30.6±5.3
	2002	15.5±1.9	32.8±2.0	31.6±2.0	27.6±2.7	18±2.6	20.6±3.2	20.4±3.6
Bananas	2008	6.1±1.8 ^{***}	34.3±5.5	32.4±4.8	29.3±4.1	30.3±4.8	24.7±4.1	29.7±5.3
	2002	13.1±1.6	29.7±2.0	34.3±2.1	37.1±2.9	30.4±3.3	32.2±3.9	27.4±3.9
Berries	2008	0 ^a	1.1±0.9 ^a	4.7±1.5 ^a	7.8±2.3 ^a	14.4±3.8	11.6±3.5	4.3±1.5 ^a
	2002	0.2±0.2 ^a	0.3±0.2 ^a	4.7±1.0	5.8±1.3	13.7±2.5	9.5±2.3 ^a	5.2±1.8 ^a
Citrus fruits	2008	0 ^a	0 ^a	6.4±3.2 ^a	6.4±2.7 ^a	5.4±1.6 ^a	14.6±4.8	6.4±2.1 ^a
	2002	0.2±0.2 ^a	0.3±0.2 ^a	1.4±0.4 ^a	4.6±1.2 ^a	7.4±1.7 ^a	6.5±1.8 ^a	4.6±1.5 ^a
Grapes	2008	0 ^a	0 ^a	6.3±2.4 ^a	9.4±3.4	15.8±4.0	17.3±3.5	14.3±3.1
	2002	0 ^a	0.5±0.3 ^a	3.3±0.9	9.1±1.9	11.8±2.3	15±3.0	10±2.5 ^a
Melons	2008	0 ^a	0 ^{*,a}	3.6±1.8 ^a	10.1±4.0	2.9±1.2 ^{*,a}	4.7±2.0 ^a	4.6±2.0 ^a
	2002	0.7±0.5 ^a	1±0.4 ^a	4.4±1.0	7.2±1.6	7.9±1.9 ^a	11.2±2.7	6.2±2.1 ^a
Types of juice^c								
Apple/apple blend	2008	4±1.7 ^{***}	17.9±4.7*	24.4±4.2*	29.6±4.2	32.4±4.7	31.1±5.3	22.8±4.0*
	2002	10.3±1.6	28.5±1.9	34.1±2.8	31.4±2.8	30.7±3.3	28.1±3.6	34±4.1
Grape/grape blend	2008	1.7±1.3 ^a	6.4±4.3 ^a	7.7±2.7 ^a	6.4±2.1 ^a	5.7±2.8 ^{*,a}	7±2.4 ^a	12.5±3.3
	2002	4.1±1.1 ^a	8.4±1.2	12.3±1.4	11.9±2.0	13.1±2.5	11.7±2.5	14.2±3.1
Citrus/citrus blend	2008	0 ^a	1.8±1.2 ^a	2.7±1.5 ^a	10.5±3.4	11.7±4.1	9.9±2.5*	12.1±3.1
	2002	0 ^a	1.9±0.7 ^a	4.4±0.9	11.1±1.9	19.5±2.9	19.5±3.3	16.3±3.1
Sample size	2008	166	249	256	243	251	219	212
	2002	486	708	687	371	239	189	168

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.^bIncludes all baby food and non-baby food fruits.^cIncludes all 100% juice (baby and non-baby).*Means between 2008 and 2002 significantly different at $P<0.05$.**Means between 2008 and 2002 significantly different at $P<0.01$.

26.9%±1.8% in 2008 and 2002, respectively; $P=0.07$). Breastfeeding during the second year of life in 2008 was similar to that reported in 2002 (7.4%±1.1% vs

7.1±0.9, respectively). Overall, in 2008 there were 49.4%±1.7% of infants being breastfed at age 6 months and 24.2%±1.4% at age 12 months.

Table 5. Top five fruits consumed by infants and toddlers in the Feeding Infants and Toddlers Study 2008 and 2002

2008		2002	
Top 5 fruits by age group	Percentage consuming at least once in a day	Top 5 fruits by age group	Percentage consuming at least once in a day
	<i>mean ± standard error</i>		<i>mean ± standard error</i>
4-5.9 mo (n=166)		4-5.9 mo (n=486)	
Baby food apples	6.1 ± 2.4 ^a	Baby food apples	14.7 ± 1.8
Baby food bananas	5.5 ± 1.8	Baby food bananas	12 ± 1.6
Baby food pears	4.7 ± 2.0 ^a	Baby food peaches	7.5 ± 1.4
Baby food peaches	3.8 ± 2.0 ^a	Baby food pears	6.6 ± 1.3
Canned applesauce	1.2 ± 0.7 ^a	Baby food prunes	2 ± 0.7 ^a
6-8.9 mo (n=249)		6-8.9 mo (n=708)	
Baby food apples	25.3 ± 5.1	Baby food apples	29.2 ± 1.9
Baby food bananas	18.1 ± 3.9	Baby food bananas	23.4 ± 1.8
Fresh banana	16.8 ± 5.2	Baby food pears	16.7 ± 1.6
Baby food pears	9.6 ± 2.4	Baby food peaches	12.5 ± 1.4
Baby food peaches	6.9 ± 1.9 ^a	Fresh banana	7.3 ± 1.1
9-11.9 mo (n=256)		9-11.9 mo (n=687)	
Baby food apples	21.3 ± 4.1	Fresh banana	18.5 ± 1.7
Fresh banana	20 ± 4.0	Baby food apples	18.5 ± 1.6
Baby food bananas	13.7 ± 3.6	Baby food bananas	16.8 ± 1.6
Baby food pears	11.2 ± 3.0	Baby food pears	12.3 ± 1.4
Canned applesauce	7.5 ± 2.1 ^a	Canned applesauce	10.9 ± 1.4
12-14.9 mo (n=243)		12-14.9 mo (n=371)	
Fresh banana	23.6 ± 3.8	Fresh banana	32.7 ± 2.8
Canned applesauce	16.8 ± 4.1	Canned applesauce	14.1 ± 2.2
Fresh grapes	9.4 ± 3.4	Fresh grapes	9.1 ± 1.9
Fresh apple	6.3 ± 1.9 ^a	Fresh apple	8.9 ± 1.7
Canned peaches	6.1 ± 2.0 ^a	Canned peaches	7.3 ± 1.6
15-17.9 mo (n=251)		15-17.9 mo (n=239)	
Fresh banana	29.6 ± 4.8	Fresh banana	27.7 ± 3.2
Fresh apple	18.2 ± 4.1	Fresh strawberries	12.9 ± 2.4
Fresh grapes	15.8 ± 4.0	Fresh grapes	11.8 ± 2.3
Canned applesauce	12.4 ± 3.0	Fresh apple	10 ± 2.1
Fresh strawberries	10.9 ± 3.7	Canned peaches	9.6 ± 2.2
18-20.9 mo (n=219)		18-20.9 mo (n=189)	
Fresh banana	24.1 ± 4.0	Fresh banana	31.4 ± 3.9
Fresh grapes	17.3 ± 3.5	Fresh grapes	15 ± 3.0
Fresh apple	16.6 ± 3.9	Fresh apple	12.9 ± 2.7
Canned peaches	14.2 ± 4.5	Fresh strawberries	8.7 ± 2.2 ^a
Canned applesauce	9 ± 2.5 ^a	Canned applesauce	8.3 ± 2.1 ^a
21-23.9 mo (n=212)		21-23.9 mo (n=168)	
Fresh banana	29.7 ± 5.3	Fresh banana	27.1 ± 3.9
Fresh apple	22.3 ± 5.1	Fresh apple	13 ± 3.1
Fresh grapes	14.3 ± 3.1	Raisins	12.3 ± 2.7 ^a
Canned applesauce	9.5 ± 2.3 ^a	Fresh grapes	10 ± 2.5 ^a
Canned peaches	9.4 ± 4.5 ^a	Canned applesauce	6.8 ± 2.2 ^a

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

In Table 2, the percentage of infants and toddlers consuming different types of milk shows a higher percentage of infants receiving breast milk from 4 to 11.9 months of age with a concurrent decreasing percentage of infants receiving formula; a trend that is significantly different for the 9- to 11.9-month-old age group only. Furthermore, a small but albeit concerning proportion of infants are consuming cow's milk at age 6 to 8.9 and 9 to 11.9 months, 5% and 17%, respectively; however, among 12- to 14.9-month-old toddlers, we see

a significantly smaller percentage consuming cow's milk in 2008 compared to 2002. During the second year of life, among the children consuming cow's milk, the most commonly consumed type of milk was whole milk (60% to 68% of toddlers) and 14%, 21%, 30%, and 33% reported consumption of reduced-fat milk (1% to 2% and nonfat varieties) in 12- to 14.9-month-olds, 15- to 17.9-month-olds, 18- to 20.9-month-olds, and 21- to 23.9-month-olds, respectively, similar to the percentages seen in the 2002 survey (data not shown).

Table 6. Percentage of infants and toddlers consuming different types of vegetables in the Feeding Infants and Toddlers Study 2008 and 2002

Food group/food	Survey year	Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age (mo)						
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		<i>mean ± standard error</i>						
Any vegetable	2008	25.9±4.6	62.8±5.3	72.3±4.8	72.4±4.7	70.8±5.0	72.1±4.1	68.1±5.7
	2002	32.1±2.3	67.5±2.0	68.9±2.0	74.3±2.6	74.5±3.1	80.8±3.1	79.3±3.4
Baby food vegetables	2008	24.3±4.6	51.3±5.3	33.8±4.3	15.1±3.5	7.6±2.3 ^b	2.7±1.6	1.5±1.0 ^b
	2002	30.7±2.3	56.9±2.1	34.6±2.0	13.1±1.9	3.5±1.4 ^b	1.8±1.0	1.8±1.1 ^b
Cooked vegetables ^a	2008	1.8±0.7 ^b	15.2±3.5	45.4±5.0	61±4.8	60.7±5.1	69.2±4.2	62.9±5.7
	2002	2±0.7 ^b	15±1.5	41.9±2.2	64.6±2.9	67.2±3.3	78±3.2	71.3±3.8
Raw vegetables	2008	0 ^b	0* ^b	4.8±1.9 ^b	6.1±1.9 ^b	9.5±2.3	8.6±2.7 ^b	15.6±4.5
	2002	0.4±0.4 ^b	1±0.5 ^b	3.7±0.9	5.6±1.3 ^b	12.2±2.3	14.6±2.9	16.9±3.2
Types of vegetables^c								
Dark green vegetables ^d	2008	0 ^b	2±1.6 ^b	10.9±3.6	10.9±3.2	6.5±1.8 ^b	12.6±4.5	8.7±2.6 ^b
Deep yellow vegetables ^e	2008	20.5±4.3	36±4.9	30.3±4.1	24.4±4.5	15.1±3.6	20.7±5.1	15.4±4.7
	2002	21.7±2.0	41.3±2.1	27.4±1.9	22.1±2.5	13±2.3	13.7±2.9	11.4±2.6 ^b
White potatoes	2008	0.6±0.4* ^b	5.4±2.5 ^b	20.1±3.6	32.4±4.6	29.6±5.0	26.1±4.2**	31.5±5.6
	2002	2±0.6 ^b	9.9±1.3	21.6±1.8	33.9±2.8	36.1±3.4	44.5±4.1	36.9±4.1
French fries and other fried potatoes	2008	0 ^b	0.8±0.6 ^b	6.3±2.3 ^b	18.5±3.8	11.6±3.7	13.8±3.2*	16.7±3.7
	2002	0.5±0.3 ^b	2.4±0.6 ^b	8.3±1.2	13±1.9	19.3±2.8	26.2±3.8	19±3.2
Other starchy vegetables ^f	2008	1.8±0.9* ^b	12.4±3.5	12.6±2.7	11.8±2.1	22.8±4.3	17.9±4.5	22.6±4.6
	2002	4.9±1.2	11.3±1.4	15.8±1.5	16.1±2.0	18.8±2.7	22±3.5	23.8±3.7
Other vegetables ^g	2008	8.1±3.3 ^b	23.9±4.9	28.4±4.4	26.8±3.7*	34.3±4.4	36.2±5.3	35.2±5.6
	2002	9.3±1.5	23.1±1.8	32.7±2.0	37.8±2.9	35.1±3.4	46.4±4.1	40.8±4.3
Sample size	2008	166	249	256	243	251	219	212
	2002	486	708	687	371	239	189	168

^aIncludes 100% vegetable juice.^bPoint estimate is considered imprecise because of small sample size and uncommon or very common event.^cIncludes commercial baby food, cooked vegetables, and raw vegetables.^dReported dark-green vegetables include broccoli, spinach and other greens, and romaine lettuce.^eReported deep-yellow vegetables include carrots, pumpkin, sweet potatoes, and winter squash.^fReported starchy vegetables include corn, green peas, immature lima beans, black-eyed peas (not dried), cassava, and rutabaga.^gOther reported vegetables include artichoke, asparagus, beets, Brussels sprouts, cabbage, cauliflower, celery, cucumber, eggplant, green beans, lettuce, mushrooms, okra, onions, pea pods, peppers, tomatoes/tomato sauce, wax/yellow beans, and zucchini/summer squash.*Means between 2008 and 2002 significantly different at $P<0.05$.**Means between 2008 and 2002 significantly different at $P<0.01$.

The use of complementary foods in 2008 is shown in Figure 1. There was minimal consumption of foods beside grains (10.9% predominately in the form of infant cereal). The majority of complementary foods appear in the 4- to 5.9-month-olds (Figure 1), with infant cereal being the most commonly consumed (Figure 2). In 2008, 50.4% of infants consumed infant cereal compared to 64.5% in 2002 ($P<0.05$) (see Figure 2 and Table 3). Figure 2 also illustrates that there is a significantly lower proportion of infants consuming infant cereal at age 9 to 11.9 months in the 2008 compared to the 2002 survey. The next most commonly consumed foods were vegetables and fruit. Very few 4- to 5.9-month-olds consumed meat or other protein sources, but consumption did increase among children in the older age groups. Approximately 4.8% of infants consumed desserts, sweets, and sweetened beverages in the second youngest age group; a proportion that triples in 6- to 8.9-month-olds and reaches 43% among the 9- to 11.9-month-olds. Whereas Figure 1 shows the percentage of children consuming any complementary

foods in the 2008 survey, Tables 3 through 9 provide the detailed information on the types of foods consumed.

Grains

Consumption of other grain products is shown in Table 3. Non-infant cereals are being introduced as early as 6 to 8.9 months with a dramatic rise in the percent consuming at age 9 to 11.9 months. Similar proportions of infants and toddlers were consuming non-infant cereals in 2008 as were in the earlier survey. Two other foods with an interesting pattern from the 2002 data were bread/rolls and pastas in a mixed dish. In the 2008 data, we see significantly lower consumption of bread and rolls among toddlers in two age groups, 12 to 14.9 months and 18 to 20.9 months; whereas in the oldest age group, a significantly higher percentage of 21- to 23.9-month-olds were consuming these foods than in the previous survey. For pastas eaten in a mixed dish (eg, ravioli and lasagna), a significantly

Table 7. Top five vegetables consumed by infants and toddlers in the Feeding Infants and Toddlers Study 2008 and 2002

2008		2002	
Top 5 vegetables by age group	Percentage consuming at least once in a day <i>mean±standard error</i>	Top 5 vegetables by age group	Percentage consuming at least once in a day <i>mean±standard error</i>
4-5.9 mo (n=166)		4-5.9 mo (n=486)	
Baby food sweet potatoes	11.01±3.5 ^a	Baby food sweet potatoes	8.5±1.3
Baby food green beans	7.9±3.3 ^a	Baby food carrots	7.1±1.2
Baby food squash	4.6±2.4 ^a	Baby food squash	6.2±1.3
Baby food carrots	4.4±1.9 ^a	Baby food green beans	5.9±1.2
Baby food peas	1.6±0.8 ^a	Baby food peas	4.7±1.2
6-8.9 mo (n=249)		6-8.9 mo (n=708)	
Baby food sweet potatoes	16.2±4.2	Baby food carrots	13.2±1.4
Baby food mixed/garden vegetables	14.3±4.8	Baby food sweet potatoes	12.7±1.4
Baby food carrots	11.3±2.5	Baby food squash	12.4±1.4
Baby food peas	9.5±3.3	Baby food green beans	11.1±1.3
Baby food squash	9.0±2.3	Baby food peas	7.9±1.2
9-11.9 mo (n=256)		9-11.9 mo (n=687)	
Mashed/whipped potatoes	10.5±2.7	Baby food mixed/garden vegetables	8.9±1.3
Baby food sweet potatoes	10.4±2.8	Cooked green beans	8.8±1.2
Cooked broccoli	7.7±3.5 ^a	French fries/other fried potatoes	8.4±1.3
Cooked green beans	7.0±2.0 ^a	Cooked carrots	7.4±1.2
Baby food green beans	6.8±1.9 ^a	Mashed/whipped potatoes	7.2±1.1
12-14.9 mo (n=243)		12-14.9 mo (n=371)	
French fries/other fried potatoes	18.5±3.8	Cooked green beans	18.4±2.3
Mashed/whipped potatoes	11.2±3.9	French fries/other fried potatoes	13.0±1.9
Cooked green beans	8.6±2.0 ^a	Cooked carrots	9.5±1.8
Cooked carrots	6.7±2.0 ^a	Mashed/whipped potatoes	9.4±1.7
Baked/boiled potatoes	6.7±2.1 ^a	Cooked peas	8.3±1.5
15-17.9 mo (n=251)		15-17.9 mo (n=239)	
Mashed/whipped potatoes	16.7±4.2	French fries/other fried potatoes	19.3±2.8
Cooked green beans	15.6±3.3	Cooked green beans	14.1±2.5
Cooked peas	11.8±3.3	Baby food peas	11.7±2.2
French fries/other fried potatoes	11.6±3.7	Mashed/whipped potatoes	10.7±2.3
Cooked corn	6.9±2.8 ^a	Cooked corn	8.6±2.1 ^a
18-20.9 mo (n=219)		18-20.9 mo (n=189)	
Cooked carrots	16.6±5.0	French fries/other fried potatoes	26.2±3.8
Cooked corn	14.3±4.4	Cooked green beans	19.0±3.4
Cooked green beans	14.2±4.6	Cooked peas	11.2±2.7
French fries/other fried potatoes	13.8±3.2	Cooked corn	10.8±2.7 ^a
Cooked broccoli	10.3±4.4	Cooked broccoli	9.0±2.4 ^a
21-23.9 mo (n=212)		21-23.9 mo (n=168)	
French fries/other fried potatoes	16.7±3.7	French fries/other fried potatoes	19.0±3.2
Cooked green beans	16.1±4.3	Cooked green beans	16.5±3.1
Cooked corn	13.7±3.2	Cooked corn	13.9±3.1
Cooked carrots	11.1±4.6	Cooked peas	11.0±2.7 ^a
Cooked peas	9.8±3.7 ^a	Cooked mixed vegetables	10.0±3.2 ^a

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

higher percentage of 15- to 17.9-month-olds and 21- to 23.9-month-olds were consuming these foods in 2008 compared to 2002.

Fruits and Juices

For fruits and juices we once again see a significantly lower proportion of infants in the 4- to 5.9-month-old and 6- to 8.9-month-old age groups consuming jarred baby

food fruit and 100% fruit juice in 2008 compared to 2002, and this trend continued among 9- to 11.9-month-old children for juices (Table 4). However, among children aged 18 to 20.9 months, we see a significantly higher proportion of toddlers consuming both jarred baby food fruit and non-baby fruit in the 2008 survey. Overall, the percentage of children consuming any discrete fruit at least once a day ranged from a low of 18.5% among 4- to 5.9-month-olds to a high of 84% among 18- to 20.9-month-

Table 8. Percentage of infants and toddlers consuming meat or other protein sources in the Feeding Infants and Toddlers Study 2008 and 2002

Food group/food	Year	Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age (mo)						
		6-11			12-23			
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		<i>mean ± standard error</i>						
Any meat or protein source	2008	3.1 ± 2.0 ^a	38.5 ± 5.4	76.9 ± 3.7	91.4 ± 2.3	91 ± 2.8	97.6 ± 1.0 ^{*a}	96.1 ± 1.3 ^a
	2002	6.9 ± 1.3	47 ± 2.1	78 ± 1.8	86.1 ± 2.2	89.8 ± 2.1	93.1 ± 1.8 ^a	93.8 ± 2.3 ^a
Baby food meat	2008	0 ^a	4.6 ± 1.9 ^a	1.2 ± 0.5 ^{**a}	2.1 ± 0.9 ^a	0.9 ± 0.6 ^a	0.7 ± 0.4 ^a	0.2 ± 0.2 ^a
	2002	0.4 ± 0.2 ^a	4.8 ± 0.9	5.9 ± 1.1	3.5 ± 1.0 ^a	2.4 ± 1.0 ^a	1.3 ± 0.9 ^a	2.4 ± 1.1 ^a
Non-baby food meat	2008	0 ^a	3.6 ± 1.3 ^a	33.1 ± 5.0	60.4 ± 4.8	74.9 ± 3.7	76.2 ± 4.2	76.1 ± 4.7
	2002	0.6 ± 0.5 ^a	5.6 ± 1.0	28 ± 2.0	54 ± 3.0	66.2 ± 3.4	76.1 ± 3.4	80 ± 3.5
Other protein sources	2008	0.2 ± 0.2 ^a	12.6 ± 3.7	32.3 ± 3.7	59.4 ± 4.5	60.8 ± 5.3	65.2 ± 4.7	70 ± 5.2 [*]
	2002	0.6 ± 0.4 ^a	8.3 ± 1.2	33.3 ± 1.2	53.2 ± 3.0	61.3 ± 3.4	66.5 ± 3.7	56.6 ± 4.3
Dried beans and peas, vegetarian meat substitutes	2008	0 ^a	3.1 ± 1.6 ^a	2 ± 0.8 ^a	12.5 ± 3.5	11.5 ± 3.4	14.5 ± 5.3	11.4 ± 3.4
	2002	0.3 ± 0.3 ^a	1.3 ± 0.4 ^a	2.7 ± 0.7 ^a	6.9 ± 1.4	6.4 ± 1.7 ^a	8.2 ± 2.5 ^a	7.7 ± 2.3 ^a
Eggs	2008	0 ^a	0.8 ± 0.5 ^a	8.8 ± 2.9	14.7 ± 3.5	28.9 ± 4.6	22.1 ± 4.9	17.1 ± 3.2
	2002	0.1 ± 0.1 ^a	2.3 ± 0.7 ^a	6.9 ± 1.0	16.3 ± 2.2	24.4 ± 3.1	24.1 ± 3.6	22.5 ± 3.7
Peanut butter, nuts, and seeds	2008	0 ^a	0.1 ± 0.1 ^a	3.5 ± 2.3 ^a	2.4 ± 0.9 ^a	3.2 ± 1.5 ^a	7.3 ± 4.0 ^a	4.6 ± 1.9 ^a
	2002	0 ^a	0.3 ± 0.2 ^a	1.1 ± 0.4 ^a	3.1 ± 1.0 ^a	7.7 ± 1.8 ^a	5.4 ± 1.9 ^a	3.3 ± 1.2 ^a
Cheese	2008	0 ^a	3 ± 1.7 ^a	13.1 ± 3.7	21 ± 4.5	24.8 ± 4.1	31 ± 5.3	31.6 ± 5.0
	2002	0 ^a	1.5 ± 0.6 ^a	15.5 ± 1.6	29.8 ± 2.8	32.7 ± 3.4	39.3 ± 4.1	31.9 ± 3.8
Yogurt	2008	0.2 ± 0.2 ^a	7 ± 3.1 ^a	11.2 ± 1.9	25 ± 4.3 [*]	17.8 ± 3.1	24.4 ± 4.3	27.8 ± 5.8 [*]
	2002	0.2 ± 0.2	3.8 ± 3.1	15.4 ± 1.9	15.5 ± 4.3	20.9 ± 3.1	15.1 ± 4.3	14.6 ± 5.8
Protein sources in mixed dishes	2008	2.9 ± 2.4 ^a	25.8 ± 5.0 [*]	42.4 ± 5.0	33.2 ± 4.6	24.5 ± 4.7	22.7 ± 4.4	24.6 ± 5.2
	2002	5.9 ± 1.2	36.8 ± 2.0	46.9 ± 2.2	29.6 ± 2.7	24.4 ± 3.0	22.4 ± 3.3	17.3 ± 3.2
Baby food dinners	2008	2.9 ± 2.0 ^a	24 ± 5.0	24.9 ± 4.3 [*]	9.9 ± 2.5	3.4 ± 1.5 ^a	1.3 ± 0.9 ^a	0.2 ± 0.2 ^a
	2002	5.3 ± 1.1	33.1 ± 2.0	34.6 ± 2.1	10.5 ± 1.8	2.9 ± 1.2 ^a	1.6 ± 0.8 ^a	1.1 ± 0.9 ^a
Beans and rice, chili, and other bean mixtures	2008	0 ^a	0 ^a	0.9 ± 0.6 ^a	0.4 ± 0.3 ^a	1 ± 0.6 ^a	0.9 ± 0.5 ^a	0.6 ± 0.4 ^a
	2002	0 ^a	0 ^a	0.8 ± 0.4 ^a	1.1 ± 0.5 ^a	1.8 ± 1.0 ^a	0.9 ± 0.7 ^a	2.1 ± 1.5 ^a
Mixtures with vegetables and/or rice/pasta	2008	0 ^a	0.4 ± 0.3 ^a	12.6 ± 3.7 [*]	15.9 ± 4.2	10.4 ± 2.9	10.8 ± 3.0	14.8 ± 4.9
	2002	1 ± 0.6 ^a	1.2 ± 0.5 ^a	4.7 ± 1.0	8.3 ± 1.6	9.8 ± 2.2	10.5 ± 2.6 ^a	4.7 ± 1.8 ^a
Soup ^b	2008	0 ^a	1.4 ± 0.7 ^a	5.7 ± 2.1 ^a	10.2 ± 2.5	12.8 ± 4.2	10 ± 3.4	9.2 ± 2.1 ^a
	2002	0 ^a	3.2 ± 0.8	9.4 ± 1.3	11.8 ± 1.9	10.9 ± 2.1	11.5 ± 2.5	9.7 ± 2.3 ^a
Types of meat^c								
Beef	2008	0 ^a	0.4 ± 0.2 ^{*a}	1.7 ± 0.7 ^{**a}	6.8 ± 2.1 ^{*a}	13.4 ± 3.4	15.9 ± 4.7	13.9 ± 4.9
	2002	0.5 ± 0.4 ^a	2 ± 0.6 ^a	6 ± 1.0	13.2 ± 1.9	12.7 ± 2.4	13.5 ± 2.6	17.6 ± 3.2
Chicken or turkey	2008	0 ^a	5.7 ± 2.1 ^a	21.7 ± 4.4	35.6 ± 4.9	47 ± 5.0	38 ± 5.2	40.3 ± 5.4
	2002	0.5 ± 0.3 ^a	5.9 ± 1.0	20 ± 1.7	31.5 ± 2.7	41.4 ± 3.5	43.2 ± 4.1	44.5 ± 4.3
Fish or shellfish	2008	0 ^a	0.2 ± 0.2 ^a	1.9 ± 1.4 ^a	6 ± 1.8 ^a	2.8 ± 1.0 ^{*a}	7.2 ± 2.1 ^a	5 ± 2.2 ^a
	2002	0 ^a	0.4 ± 0.2 ^a	2.5 ± 0.7 ^a	4.6 ± 1.1 ^a	7.5 ± 1.8 ^a	6.9 ± 1.9 ^a	8.9 ± 3.0 ^a
Hot dogs, sausages, and cold cuts	2008	0 ^a	1.1 ± 0.8 ^a	6.7 ± 2.2 ^a	17.8 ± 3.9	22.2 ± 4.1	22.3 ± 3.9	28.4 ± 5.2
	2002	0 ^a	1.3 ± 0.5 ^a	6.4 ± 1.1	15.8 ± 2.1	20 ± 2.8	18.9 ± 3.6	27.6 ± 3.9
Pork/ham	2008	0 ^a	0.8 ± 0.8 ^a	1.7 ± 0.9 ^a	3.3 ± 1.2 ^{*a}	5.5 ± 2.5 ^a	14.1 ± 4.4	14.8 ± 5.0
	2002	0 ^a	1.5 ± 0.6 ^a	3.5 ± 0.8	8.7 ± 1.7	9 ± 2.1	13.9 ± 2.7	11.2 ± 2.5 ^a
Other	2008	0 ^a	0 ^a	3.2 ± 3.0 ^a	4.3 ± 1.8 ^a	3.1 ± 1.5 ^a	0.6 ± 0.4 ^a	2.7 ± 1.4 ^a
	2002	0 ^a	0.4 ± 0.3 ^a	2.1 ± 0.7 ^a	2.8 ± 1.0 ^a	1.9 ± 0.9 ^a	4.1 ± 1.9 ^a	3.8 ± 1.6
Sample size	2008	166	249	256	243	251	219	212
	2002	486	708	687	371	239	189	168

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

^bThe amount of protein provided by soup varies.

^cIncludes baby food and non-baby food meats.

*Means between 2008 and 2002 significantly different at $P < 0.05$.

**Means between 2008 and 2002 significantly different at $P < 0.01$.

olds in 2008, whereas in 2002 it ranged from a low of 36.5% among children aged 4 to 5.9 months to a high of 76% among 9- to 11.9-month-olds. The percentage of children

consuming any fruit in 2008 was significantly different from the 2002 survey for only two age groups: the youngest (those aged 4 to 5.9 months) and 18- to 20.9-month-olds (84% vs

Table 9. Percentage of infants and toddlers consuming desserts, sweets, sweetened beverages, and salty snacks in the Feeding Infants and Toddlers Study 2008 and 2002

Food group/food	Year	Percentage of Infants and Toddlers Consuming at Least Once in a Day						
		Age (mo)						
		4-5.9	6-8.9	9-11.9	12-14.9	15-17.9	18-20.9	21-23.9
		← mean ± standard error →						
Any type of dessert, sweet, or sweetened beverage	2008	4.8±2.2 ^a	17±4.5 ^{**}	43±5.0 ^{**}	62.8±4.6 [*]	68.1±4.9 ^{**}	74±4.7 ^{**}	80.6±4.8
	2002	8.5±1.4	36±2.0	58.8±2.1	75.4±2.5	83.6±2.6	90.2±2.1 ^a	86.9±2.9
Desserts and candy	2008	4.2±2.1 ^a	11.2±2.1 ^{**}	35.9±4.8 ^{**}	53.9±4.8 [*]	51.4±5.1 ^{**}	59.2±5.4 ^{**}	67.6±5.3
	2002	5.4±1.2	32.6±2.0	53.3±2.2	65.5±2.8	69.2±3.2	81.1±2.9	73±3.8
Baby food desserts	2008	1.2±1.2 ^a	2.8±1.0 ^{***}	11.9±3.9	2±1.0 ^{***}	0.3±0.3 ^{***}	0.9±0.9 ^a	0 ^a
	2002	3.4±1.0 ^a	14.1±1.4	17.6±1.7	6.1±1.4	3.2±1.4 ^a	0 ^a	0 ^a
Cakes, pies, cookies, and pastries	2008	0.7±0.7 ^a	7.9±1.8 ^{***}	22.5±3.6 ^{**}	40.4±4.9	42±4.9	36.6±4.7 ^{**}	39.3±5.6 [*]
	2002	1.4±0.6 ^a	20.9±1.8	38.3±2.1	47.9±3.0	51.2±3.5	62.7±3.9	53.5±4.3
Baby cookies, teething biscuits, and animal crackers	2008	0.7±0.7 ^a	5.7±1.5 ^{***}	5.4±1.6 ^{***}	12.9±3.1	13.9±3.3	8.9±2.3 ^a	10.9±3.9
	2002	1.4±0.6 ^a	13.5±1.5	18.1±1.7	16.4±2.1	10.4±2.2	14.7±3.0	11±2.7 ^a
Other cookies	2008	0 ^a	2±1.0 ^{***}	13.2±2.9	21.5±4.3	20±3.6 ^{**}	18.8±3.4 ^{**}	27±5.1
	2002	0 ^a	6.3±1.1	18.4±1.7	28.3±2.7	36.7±3.4	42.7±4.0	34.4±4.1
Cake	2008	0 ^a	0.4±0.4 ^a	2.3±1.2 ^a	5.6±1.8 ^a	4.8±2.4 ^a	8.4±3.0 ^a	2.5±1.3 ^a
	2002	0 ^a	0.7±0.3 ^a	2.4±0.8 ^a	3.9±1.1 ^a	3±1.0 ^a	5.1±1.6 ^a	3.6±1.3 ^a
Pies and pastries	2008	0 ^a	0 ^a	1.5±1.3 ^a	6.4±3.8 ^a	3.4±1.9 ^a	2.9±1.2 ^a	4.6±1.9 ^a
	2002	0 ^a	0.1±0.1 ^a	0.7±0.3 ^a	2±0.7 ^a	2.6±1.2 ^a	3.3±1.6 ^a	2.7±1.3 ^a
Sweet rolls, doughnuts, muffins	2008	0 ^a	1.3±0.8 ^a	1.8±1.0 ^a	5.8±2.6 ^a	8.2±2.5 ^a	7.7±1.9 ^a	3.3±1.1 ^{***}
	2002	0 ^a	0.9±0.5 ^a	3.4±0.7	4.9±1.4 ^a	8±2.0 ^a	9.8±2.4 ^a	14.1±3.1
Ice cream, frozen yogurt, pudding	2008	1.4±1.4 ^a	0.9±0.7 ^a	6.5±3.2 ^a	10.3±3.4	9.7±2.9	13.3±4.0	14.6±4.6
	2002	0.7±0.4 ^a	2.1±0.6 ^a	6.5±1.1	11.3±1.9	16.9±2.7	18.9±3.4	15±3.0
Other desserts	2008	0 ^a	0.4±0.3 ^a	2.4±1.2 ^a	3±1.2 ^a	5.2±2.5 ^a	7.8±3.4 ^a	5.2±2.4 ^a
	2002	0.1±0.1 ^a	1.3±0.4 ^a	3.4±1.0	4.9±1.5 ^a	7±1.9 ^a	9.7±2.8 ^a	8.3±2.7 ^a
Candy	2008	0.8±0.8 ^a	0 ^{***}	0.5±0.4 ^{***}	6.6±1.7 ^a	6.3±1.7 ^{***}	20.1±4.7	31.8±5.5
	2002	0 ^a	0.8±0.3 ^a	3±0.7 ^a	9.5±1.8	14.1±2.4	19.8±3.3	21.4±3.2
Other sweets	2008	0 ^{***}	1.2±0.9 ^a	6.5±2.5 ^a	7.7±1.8 ^{***}	15.8±3.8	17.1±4.4	21.9±5.0
	2002	2.3±0.7 ^a	2.6±0.6 ^a	6±1.1	16.1±2.3	25.3±3.1	25.2±3.6	25.6±3.7
Milk flavorings	2008	0 ^a	0 ^a	1.4±1.4 ^a	0.9±0.7 ^a	0.9±0.6 ^a	3±1.5 ^a	3.7±1.6 ^a
	2002	0 ^a	0 ^a	0.1±0.1 ^a	1.2±0.8 ^a	3.2±1.2 ^a	4.7±1.9 ^a	3.5±1.8 ^a
Sugar, syrup, preserves	2008	0 ^{***}	1.2±0.9 ^a	5.2±2.1 ^a	6.8±1.6 ^{***}	15±3.8	14.4±4.2	18.3±4.8
	2002	2.3±0.7 ^a	2.6±0.6 ^a	5.9±1.1	15.9±2.2	22.6±2.9	20.7±3.4	22±3.4
Sweetened beverages	2008	0.6±0.6 ^a	5±4.3 ^a	10.7±3.2	14.3±3.0 ^{**}	29.4±5.1	28.6±5.5 ^{**}	38.2±5.6
	2002	1±0.5 ^a	5.4±1.0	10.3±1.3	29.1±2.8	36.8±3.4	46.9±4.1	38.6±4.1
Carbonated sodas	2008	0 ^a	0 ^{***}	2.1±1.5 ^a	1.4±0.8 ^a	1.6±0.8 ^{***}	4.2±1.6 ^{***}	10.8±4.7
	2002	0 ^a	0.8±0.4 ^a	1.3±0.5 ^a	2.9±1.0 ^a	10.8±2.2	10.3±2.5 ^a	10.7±2.5 ^a
Fruit-flavored drinks	2008	0.6±0.6 ^a	5±4.3 ^a	7.1±2.7 ^a	12.8±3.0 ^{**}	25.5±4.9	22.9±5.4 [*]	24.4±3.9
	2002	1±0.5 ^a	4.8±0.9	8.4±1.2	24.6±2.6	30.1±3.2	39.2±4.0	32.9±4.0
Other	2008	0 ^a	0 ^a	1.5±1.3 ^a	1.3±0.7 ^a	3.3±2.2 ^a	5.2±2.1 ^a	6.9±2.4 ^a
	2002	0 ^a	0.4±0.3 ^a	1±0.4 ^a	3.1±1.0 ^a	2.7±1.1 ^a	4.3±1.7 ^a	2.9±1.6 ^a
Salty snacks^b	2008	0 ^a	0.1±0.1 ^{***}	2.3±1.1 ^{***}	10.4±2.7	16.5±3.9	14.8±4.8	23.7±5.2
	2002	0 ^a	1.4±0.5 ^a	5.6±1.1	15.8±2.2	18.4±2.7	26.8±3.7	26±3.8
Sample size	2008	166	249	256	243	251	219	212
	2002	486	708	687	371	239	189	168

^aPoint estimate is considered imprecise because of small sample size and uncommon or very common event.

^bIncludes potato chips, popcorn, cheese curls/puffs, tortilla chips, and other types of chips and salty snacks.

*Means between 2008 and 2002 significantly different at $P<0.05$.

**Means between 2008 and 2002 significantly different at $P<0.01$.

70%). The top five most commonly consumed fruits in 2008 are shown in Table 5 for each age group.

Vegetables

There were fewer notable differences in the proportion of children consuming vegetables between the two surveys

(Table 6). Consumption of white potatoes was markedly lower in 2008 among toddlers in two age groups, 15- to 17.9-month-olds and 18- to 20.9-month-olds with the difference in latter group being statistically significant and most of this appeared to be in the form of french fries. Among children aged 18 to 20.9 months, the percent

consuming french fries significantly decreased by almost 50%. There also appeared to be a significantly lower consumption of other vegetables, which included foods like green beans, squash, and tomatoes, among children aged 12 to 14.9 months in 2008 compared to 2002. There were no significant differences by year across any of the age groups in the percentage of infants and toddlers consuming any vegetable. The top five most commonly consumed vegetables in 2008 are shown in Table 7. The younger age groups (<12 months) appear to be consuming more commonly the nutrient-rich dark-green, orange, and yellow vegetables compared to the toddlers, and french fries/fried potatoes only appears in the list for 12- to 23.9-month-olds.

Meats, Fish, Eggs, and Nuts

Table 8 presents data on the percentages of infants and toddlers consuming different types of protein sources in 2002 and 2008. Among children aged 9 to 11.9 months in 2008, we see close to an 80% decline in the percentage consuming baby food meats, which is significant without a compensating increase in other protein sources. Among the oldest toddlers, we see a significant increase in the consumption of other protein sources, which appears to be attributable primarily to the increase in yogurt consumption, and less so to legumes and vegetarian meat substitutes. There was also a significant increase in yogurt consumption among children aged 12 to 14.9 months. There were significant declines in the percentage consuming protein sources in mixed dishes for 6- to 8.9-month-olds as well as in baby food dinners for 9- to 11.9-month-olds from 2002. In this latter age group we see a significant increase in the percent consuming protein with vegetables and/or rice/pasta (12.6% vs 4.7% for 2008 and 2002, respectively). In examining the types of meats consumed (Table 8), we see significant declines in beef consumption among children aged 9 to 14.9 months as well as in fish or shellfish for children aged 15 to 17.9 months when comparing the 2008 to 2002 data.

Sweets, Sweetened Beverages, and Salty Snacks

For foods that contribute discretionary energy in the diets of infants and toddlers such as desserts, sweets, sweetened beverages, and salty snacks, we see some major shifts in the percent consuming these foods in 2008, as shown in Table 9. First, there are significantly lower percentages of children aged 6 to 20.9 months consuming desserts and candy in 2008 compared to 2002. We see this in baby food desserts for the age groups of 6 to 8.9 months, 12 to 14.9 months, and 15 to 17.9 months; in cakes, pies, and cookies for infants aged 6 through 11.9 months and in toddlers aged 18 through 23.9 months; and in candy for children aged 6 to 11.9 months and 15 to 17.9 months. Consumption of other sweets, primarily from sugar, syrup, and preserves declined significantly for children aged 4 to 5.9 months and 12 to 14.9 months from 2002 to 2008. Finally, the percentage of toddlers consuming sweetened beverages declined significantly among 12- to 14.9-month-olds and 18- to 20.9-month-olds. Among infants aged 6 to 11.9 months the percentage consuming salty snacks has also declined from 2002.

DISCUSSION

Developing good eating habits early in life is important for one's long-term health status (16-18). The new data from FITS illustrates that some positive changes have occurred while concern still exists in other areas. Of great importance is what appears to be a longer duration of breastfeeding followed by a delay in the introduction of complementary foods. The American Academy of Pediatrics recommends breastfeeding throughout the first year of life, but has disagreement among its experts on the appropriate timing of the introduction of complementary foods (19). The Committee on Breastfeeding recommends introduction of complementary foods around age 6 months when the infant is developmentally ready (20), whereas the Committee on Nutrition states that complementary foods may be introduced between age 4 and 6 months (19). The 2008 survey shows that more children are being fed consistent with this recommendation now than in 2002. This pattern of a longer duration of breastfeeding has also been documented by others for the same time period (21). Both a longer duration of breastfeeding and a delayed introduction of complementary foods are positive trends, given their suggested role in the development of childhood obesity (4,22). On the other hand, not consistent with American Academy of Pediatrics guidelines is the use of cow's milk before age 1 year, with 17% of children falling in to this category, as well as the use of reduced-fat milk in the second year of life with approximately 20% to 30% of children being fed low-fat milk. Although the American Academy of Pediatrics recommends whole milk for children aged 12 to 24 months, the American Heart Association recommends 2% milk for children in this age group (23). Whatever the type of milk, ensuring adequate intake of both total fat and essential fatty acids in the diets of toddlers requires special effort and attention. Although we do not yet have data on specific fatty acid intake from FITS 2008, with some children with relatively low fat intakes and high saturated fat intakes it is likely that they are not getting enough of the healthy types of fats. We know from FITS 2002 that toddlers were not getting enough essential fatty acids (40% not getting enough n-3 fatty acids). It is critical to include foods such as fish; avocados; and foods made with vegetable oils, such as canola and soybean oil, to help achieve the right balance of fat for toddlers. These healthy fats should also replace the saturated fats found in whole milk, and other high-fat dairy products such as butter and cheese and fatty meats, including hot dogs, bacon, and sausages.

Foods rich in iron are recommended to be introduced around 4 to 6 months of age (24). Infant cereal, a food that meets this need, was consumed in 2008 by a lower percentage of infants in two age groups—4- to 5.9-month-olds and 9- to 11.9-month-olds—compared to the 2002 survey. Whereas delaying the introduction of any complementary food is appropriate for the younger age group, a lower consumption in the older age group is of concern given the inadequate intake of iron in this age group reported by Butte and colleagues (25) in this supplement (see pages S27-S37). This was indeed the case in our observations, since a significantly lower percentage of infants in this age group was reported to be consuming baby food meats. Furthermore, 43% of infants in this age

group were consuming non-infant cereals. Whereas non-infant cereals are appropriate to encourage the development of feeding skills, they do not contain the same amount of iron on a per-gram basis as infant cereal, according to the NDSR.

A more complex pattern to interpret is the percentage of infants and toddlers consuming fruits and vegetables compared to recommendations. Whereas we see a significantly lower percentage reporting consumption of any 100% juice as well as any fruits and vegetables at 4 to 5.9 months of age—which is in line with delaying the introduction of complementary foods—and a lower percentage consuming any 100% juice between age 6 through 11.9 months with a sustained percentage of any fruit consumption, there is still a substantial proportion of infants and toddlers who do not consume any fruits or vegetables in a given day. The proportion not consuming any vegetables was even greater than that of fruits, which is consistent with studies showing a preference for fruits at this age (26,27). This finding of less-than-adequate fruit and vegetable intake among infants and toddlers is in line with others (28,29) and of concern given that parents are the gatekeepers of food for these age groups (30,31). It is also of concern for the health of our population given the World Health Organization conclusion that dietary habits from childhood through adulthood could affect one's lifetime risk of cancer (32).

On a positive note, significant reductions in the percentage of infants and toddlers consuming any desserts or candy were seen in 2008. This pattern existed among children aged 6 to 20.9 months but disappeared for those aged 21 to 23 months. In a similar manner, reductions in the percentage consuming sweetened beverages were seen from 12- to 20.9-month-olds and for salty snacks among 4- to 11.9-month-olds. Reductions in these foods—which are contributors of discretionary energy—are appropriate. Given the limited capacity of a child's stomach at these ages and the demand for nutrients required for proper growth and development, nutrient-rich foods should be among those most commonly consumed (24). We saw evidence of nutrient-rich foods being offered during the first year of life in the most commonly consumed vegetables, which consisted of sweet potatoes, carrots, green beans, and broccoli.

Although this most recent survey provides some interesting findings suggesting that the infant feeding practices and food consumption of our youngest children have improved, we must interpret them with caution (9). First, and of most importance, there are some differences in the population characteristics between 2002 and 2008 that are reflective of true population differences. The Hispanic population in the United States has grown during this time period (33), and Hispanic women have been previously shown to have higher rates of breastfeeding and a longer duration of breastfeeding compared to other racial/ethnic groups (34). Although the overall education distribution is not significantly different between 2002 and 2008, the characteristics of the 2008 sample include a higher proportion of college-educated women than the 2002 FITS sample. Therefore, it is possible that the longer breastfeeding duration and improvements in food group consumption in the 2008 FITS are related to the food choices of mothers and caretakers who, on average,

are more educated. In addition, there were fewer working mothers and more children receiving WIC benefits in 2008 than in 2002. Trends that may also explain some of our findings given the greater emphasis of breastfeeding in the WIC program (35) and women not having stop breastfeeding early due to work commitments. Second, the results also need to be interpreted with caution since this was an observational study done in a cross-sectional manner, and, thus, we cannot infer causality. Future in-depth analysis could be done to look at changes in race/ethnicity, income, and the like. Similarly, subgroup analysis could be done to determine whether any and how much of the 2008 changes could be driven by survey response issues. Lastly, some of the statistically significant findings reported here may have been due to chance.

CONCLUSIONS

The newest data from FITS appear to indicate that parents/caregivers may have heeded the advice of health care providers and public health messages that resulted from the publication of the 2002 survey. These positive changes include the longer duration of breastfeeding, a delay in the introduction of complementary foods, and a lower percentage of infants and toddlers consuming fruit juices, desserts, sweets, sweetened beverages, and salty snacks. However, there are still concerns related to low intakes of overall fruits and vegetables for all ages and iron-rich foods for 9- to 11.9-month-olds as well as the use of cow's milk before age 1 year and the use of reduced-fat milks during the second year of life. Furthermore, the duration of breastfeeding appears longer: The overall percentage of infants and toddlers breastfeeding at age 6 months and age 12 months is close to the Healthy People 2010 objectives (49% and 24% compared to 50% and 25%, respectively) (36). The findings presented here provide important insights to the content of messages and types of interventions that are still needed to improve the infant-feeding practices and food-consumption habits of infants and toddlers. Parents and caregivers play an important role in forming the dietary habits in early childhood. Research is growing showing the association between availability of healthy foods and their consumption in children (37). A dietary pattern that is low in fruits and vegetables (38) and high in fat (39-41) has been associated with excessive weight gain in older individuals. Adequate fruit and vegetable intake are especially important, as diets rich in these foods have numerous health benefits (42). Given that food preferences start early (16), are likely to continue through life, and are difficult to change in adulthood, providing adequate and high quality foods during the early years are of paramount importance for one's overall health.

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