

Toddlers' Transition to Table Foods: Impact on Nutrient Intakes and Food Patterns

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ABSTRACT

Objective To describe the differential changes in average intakes of nutrients and food groups among higher versus lower table food consumers during the transition from baby foods to table foods.

Design A comparative analysis of food and nutrient intakes in the lowest versus highest quartile of energy from table foods based on 24-hour dietary recall data.

Subjects A national random sample of 1,677 US infants and toddlers 9 to 24 months in the 2002 Feeding Infants and Toddlers Study (FITS).

Statistical Analyses Mean and percentiles of energy intake from table foods; comparisons of mean daily nutrient intake and the percentages consuming various foods and beverages in the lowest versus highest quartile of energy from table foods, by age.

Results The mean percentage of energy from table foods increased from 25% at 9 to 11 months to 63% at 19 to 24 months. Mean intakes of energy, macronutrients, sodium, folate, and fiber were significantly higher for children 9 to 11, 12 to 14, and 15 to 18 months in the highest table food energy quartiles compared to the lowest. Mean calcium intakes were significantly lower among toddlers 15 to 24 months consuming high table food energy, and associated with lower milk consumption. A higher percentage of children in the lowest quartiles of energy from table food were consuming deep yellow vegetables among ages 9 through 14 months. The percentage of children consuming popular items such as pizza, carbonated sodas, French fries, candy and other sweets was higher among those who consumed more energy from table foods in every age group.

Applications The epidemic of overweight children mandates helping parents teach healthy eating habits early. Messages that educate parents and caregivers about toddler feeding include: (1) offer a wide variety of nutri-

tious foods, particularly fruits and vegetables, in forms that are developmentally appropriate, (2) continue to feed foods that are good sources of iron, such as iron-fortified infant cereals, ready-to-eat cereals that are high in iron, and meats, (3) to ensure adequate calcium intake, build the habit of drinking milk, and (4) teach children to recognize and honor their hunger and satiety cues.

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With developmental changes from nine to 24 months of age, toddlers' dietary patterns change rapidly as the toddler transitions to the family diet (1). This is a period of high vulnerability to nutrient deficiencies, but there are relatively limited data on the intakes of young toddlers. Iron deficiency is a documented problem among one- to four-year-old children (2-4). Small studies suggest that low intakes of zinc, vitamin C, vitamin E, and fat may be of concern (3,5).

Specific familial influences on children's food patterns show the strongest effect on eating behaviors of the youngest children (6). Analysis of national dietary data on children aged one to 18 years from the National Health and Nutrition Examination Survey (NHANES) I, II, and III and NHANES 1999 to 2000 indicates that, whereas nutrient density has improved, most children do not consume a diet that meets the Dietary Guidelines (7,8). The US Department of Agriculture report card based on the Healthy Eating Index scores of children ages two to nine years indicates that most children have a diet that "needs improvement" or is "poor" with decline in quality with increasing age (9). Thus, toddlerhood is an important time to set the stage for eating habits during the preschool years.

Other research has added new insight into issues of optimal dietary patterns beginning in early childhood for the prevention of nutrition-related chronic diseases such as obesity and cardiovascular disease. Despite the common nutrition message not to restrict fat until the age of two years, one study found many toddlers consuming less than the recommended level of fat intake; this was associated with inadequate intakes of vitamin E (5). The need for nutritional guidance during this period of dietary transition in early childhood is critical to optimal diet and health in the preschool years and later. Thus, it is important to determine what US toddlers are currently eating during this important developmental period and identify nutrition issues that may result from these dietary choices.

Other FITS papers report on the nutrient adequacy and consumption of specific foods and food groups among infants nine to 11 months and toddlers 12 to 24 months of age (10,11). Table foods provide an increasing percentage of energy between the ages of nine months and 24 months. This paper focuses on changes in mean intakes of selected nutrients and consumption of foods during the transition from baby foods to table foods.

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Table 1. Means and percentiles of the percentage of energy from table foods^{a,b}

Age	Sample size ^b	Mean	25th percentile	50th percentile	75th percentile	Range
9-11 months	679	25	8	21	39	0-92
12-14 months	374	49	37	53	62	0-89
15-18 months	308	59	49	62	70	8-93
19-24 months	316	63	55	64	73	2-100

Data from 2002 Feeding Infants and Toddlers Study (FITS).

^aTable foods exclude baby foods and all beverages (breast milk, infant formula, cow's milk, baby beverages, and nonbaby beverages).

^bTabulations based on weighted data (unweighted sample size reported in table).

METHODS

The study population for this paper is older infants and toddlers ages nine to 11 months ($n=679$), 12 to 14 months ($n=374$), 15 to 18 months ($n=308$), and 19 to 24 months ($n=316$). Complete details of the study's sample design and dietary data collection are described by Devaney and colleagues (12). This paper uses 24-hour dietary recall data collected by trained telephone interviewers using the University of Minnesota's Nutrition Data System for Research (NDS-R) (13). Nutrient estimates include nutrients from breast milk and dietary supplements taken on the day of the 24-hour dietary recall (12-14). About 23% of the population ages nine to 24 months used dietary supplements.

The percentage of energy intake derived from seven categories of food (breast milk, infant formula, cow's milk, infant cereals, baby foods and baby juices, other beverages, and table foods) was estimated for each age group. (Note: baby juices included only juices marketed to infants and toddlers. All other juices and nonmilk beverages were included in the category "other beverages.") Within each age group, we stratified the sample by quartiles of the percentage of energy from table foods and compared mean 24-hour nutrient intakes and the percentages of toddlers consuming different foods and food groups using the quartile cutoff values shown in Table 1. There were no significant differences in mean age (in months), mean current body weight (in kg), and mean weight percentile between the highest and lowest quartiles within an age group.

Sample weights were calculated to account for nonresponse and to weight the sample to known population demographic characteristics. Estimates were calculated using the Statistical Analysis System, version 8.2 (SAS Institute, Inc. SAS Version 8.2, 2001, Cary, NC) and the appropriate sample weights. Standard errors and *t* tests were calculated using SUDAAN (Research Triangle Institute, SUDAAN version 7.5.6, 2002, Research Triangle Park, NC).

RESULTS

The consumption of total baby foods (commercial baby foods, baby beverages, and infant cereals) as a percentage of energy peaked at 29% at seven to eight months and declined with age (data not shown). The mean percentage of energy from table foods increased from 25% for infants ages nine to 11 months to 63% for toddlers ages 19 to 24 months (Table 1).

Energy and Nutrient Patterns

Table 2 compares mean 24-hour intakes of selected nutrients between the lowest and the highest quartiles of

energy from table foods by age group. In general, mean intakes of energy and nutrients and total grams of food increased with age and with the percentage of energy from table foods. Mean intakes of energy, carbohydrate, protein, total fat, sodium, folate, and fiber were significantly higher for infants and toddlers in the highest quartile of energy intake from table foods compared with the lowest quartile, among at least three of the four age groups ($P<.01$).

In contrast, intakes of some nutrients were lower for young children in the highest compared with the lowest quartile of energy intake from table foods. In particular, significantly lower ($P<.01$) mean intakes were found for vitamin C among children ages nine to 11 months and 19 to 24 months, for calcium among toddlers ages 15 to 18 months and 19 to 24 months, and for iron among infants ages nine to 11 months, among children in the highest vs the lowest quartile of energy intake from table foods.

The percentage of calories from total fat did not differ by quartiles of energy from table food, except among toddlers ages 15 to 18 months. However, the percentage of energy from saturated fat was significantly lower ($P<.01$) in the highest quartile than the lowest quartile for toddlers.

Foods and Food Groups

Using the same subgroups categorized by quartile of energy from table foods, we estimated the percentages of infants and toddlers consuming different food groups and selected food items at least once in a day. Table 3 presents changes from breast milk or infant formula to cow's milk; from baby food meats to table food meats; and from infant cereals to ready-to-eat cereals, breads, pasta, rice, and other grain products from nine to 11 months to 18 to 24 months of age. Among infants ages nine to 11 months, a much higher proportion of those in the lowest quartile of energy from table food were consuming infant cereal vs ready-to-eat cereal. Among infants ages nine to 11 months and toddlers 12 to 14 months, those in the highest quartile of table food consumption were more likely to consume cow's milk or breast milk than infant formula (Table 3). Among older toddlers, a lower percentage consumed cow's milk in the upper quartile of table food consumption compared with the lowest quartile (79% compared with 92% for 15 to 18 months and 71% compared with 91% for 19 to 24 months). However, the percentage who consumed reduced-fat or nonfat cow's milk was not different between the highest and lowest quartiles of table food energy for these same food groups.

Consumption of cheese, yogurt, mixed dishes, macaroni and cheese, presweetened cereals, bread, rolls, and bis-

Table 2. Mean total daily nutrient intake^a for children in the lowest and highest quartile of energy from table foods^{b,c}

	9-11 Months		12-14 Months		15-18 Months		19-24 Months	
	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile
Quartile cutoff level for percentage of energy from table foods^b	≤8	≥39	≤37	≥62	≤49	≥70	≤55	≥73
Energy (kcal)	862	1,138**	969	1,201**	1,127	1,423**	1,225	1,212
Total grams of food	1,240	1,414**	1,440	1,543	1,568	1,668	1,741	1,355**
Protein (g)	19	36**	36	45**	46	56*	44	48
Carbohydrate (g)	124	153**	127	158**	141	190**	168	157
Total fat (g)	33	44**	37	45**	44	52*	44	46
% of kcal from total fat	35	35	34	34	35	32*	32	34
% of kcal from saturated fat	16	15	17	14**	18	13**	15	13**
Cholesterol (mg)	32	120**	117	163**	166	207	170	183
Sodium (mg)	275	1,304**	924	1,659**	1,217	2,068**	1,422	1,819**
Calcium (mg)	656	705	1,009	828*	1,165	869**	1,051	684**
Iron (mg)	19	12**	11	10	8	12**	8	10*
Vitamin A (mcg, RAE)	775	684*	734	613	620	736	794	636
β-carotene equiv. (mcg)	2,709	1,594**	3,097	1,405**	1,040	2,694**	1,118	1,474
Vitamin C (mg)	111	90**	81	65	95	95	111	70**
Total folate (mcg)	120	216**	137	229**	175	291**	213	251
Dietary fiber (g)	6	8**	6	9**	6	11**	6	9**
Caffeine (mg)	0.2	1.1*	1.1	2.4	1.6	3.6	1.9	4.5
Sample size ^c	194	149	100	91	74	78	73	85

Data from 2002 Feeding Infants and Toddlers Study (FITS).

^aIncludes nutrients from foods and supplements.

^bTable foods exclude baby foods and all beverages (breast milk, infant formula, cow's milk, baby beverages, and nonbaby beverages).

^cTabulations based on weighted data (unweighted sample size reported in Table).

*Significantly different from the lowest quartile at the $P < .05$ level of significance.

**Significantly different from the lowest quartile at the $P < .01$ level of significance.

cuits was higher for the upper quartiles of infants ages nine to 11 months and toddlers ages 12 to 14 months and tended to “level-out” at 19 to 24 months of age (when energy from table food in both the highest and lowest quartiles of table food was greater than 50%; Table 3). Consumption of hot dogs or sausages was higher in the highest quartiles of table food energy compared with the lowest quartile across all age groups.

The transition from commercial baby fruits and vegetables to table food fruits and vegetables is described in Table 4. On a given day, 25% to 30% of infants and toddlers ages 9 to 24 months consumed no fruit, and 20% to 25% consumed no vegetables. The percentage consuming any fruit (baby and nonbaby sources) did not differ significantly by quartiles of table food energy. Although more toddlers in the highest quartile of energy from table food were consuming vegetables compared with the lowest quartile (3% to 13% across age groups), more of these children were consuming potatoes, particularly french fries. For example, among infants ages 9 to 11 months, potatoes were consumed by 35% of the highest quartile compared with 8% in the lowest of quartile. French fries were consumed by 15% vs 2%, respectively. In the youngest two age groups, a higher percentage of children in the lowest quartile of table food energy were consuming deep yellow vegetables in the form of baby food vegetables. Overall, very few children in any of the groups were consuming dark green vegetables (<1% to 14%). Earlier introduction of table foods seems to be associated with

earlier introduction of potatoes and fewer children consuming deep yellow vegetables.

Table 5 shows the differential introduction of sweets into the diets of children getting more vs less energy from table foods. Energy-dense, nutrient-poor foods such as candy, carbonated sodas, and snacks were introduced during the critical transition from baby foods to table foods, and the percentage consuming these items increased as toddlers approached their second birthday. About nine of 10 toddlers ages 15 to 24 months in the top quartile of table food energy consumed sweets, which included desserts, candy, and sweetened beverages. The percentage consuming carbonated sodas and fruit-flavored drinks was higher in the highest quartile of food energy and leveled off for the 19- to 24-month age group. The percentage consuming chips and salty snacks was higher for the highest quartile compared with the lowest quartile for all age groups. By 19 to 24 months of age, about 25% were consuming chips or other salty snacks on any given day.

DISCUSSION

Little information is available on how the transition from infant foods to table foods impacts on either nutrient intake or consumption of various foods or food groups. This is the first study to assess the differential impact of increasing energy from table foods at various stages of development. Although the data are cross-sectional and

Table 3. Percentage consuming different types of milk, meat, other protein sources, mixed dishes, and grain products in the lowest and highest quartiles of energy from table foods^{a,b}

	9-11 Months		12-14 Months		15-18 Months		19-24 Months	
	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile
Quartile cutoff level for percentage of energy from table foods^a	≤8	≥39	≤37	≥62	≤49	≥70	≤55	≥73
Milk (% consuming)								
Breast milk	13	30	9	15	5	3	12	3
Infant formula	88	57	32	16	11	3	3	0
Cow's milk	7	37	79	85	92	79	91	71
Whole milk	5	26	69	62	77	61	63	37
Reduced-fat milk	2	11	10	24	19	20	32	34
Nonfat milk	0	<1	0	1	0	3	5	6
Meat or other protein source (% consuming)								
Baby food meats	4	0	5	0	0	0	0	0
Nonbaby food meats ^c	5	65	42	63	70	80	78	90
Hot dogs, sausages	1	18	7	11	9	21	23	32
Eggs	1	14	5	24	16	24	21	22
Peanut butter, nuts, seeds	<1	6	5	12	12	11	8	12
Cheese	<1	36	16	38	23	49	39	45
Yogurt	2	31	13	19	13	35	11	17
Mixed dishes (% consuming)								
All types ^d	56	73	63	77	72	73	60	64
Baby food dinners	53	10	30	2	7	<1	4	1
Pizza	<1	7	3	7	5	17	7	10
Macaroni and cheese	0	11	6	22	11	15	14	20
Grain products (% consuming)								
Infant cereals	87	32	43	10	17	3	4	<1
No-infant cereals	24	56	56	67	54	54	59	46
Not presweetened, RTE ^e	21	34	34	43	39	32	32	21
Presweetened, RTE	3	12	12	21	15	20	17	20
Bread, rolls, biscuits	5	45	23	61	40	57	49	54
Pasta, rice, pasta or rice mixtures	4	33	33	26	39	40	35	36
Sample size ^b	194	149	100	91	74	78	73	85
Data from 2002 Feeding Infants and Toddlers Study (FITS).								
^a Table foods exclude baby foods and all beverages (breast milk, infant formula, cow's milk, baby beverages, and nonbaby beverages).								
^b Tabulations based on weighted data (unweighted sample size reported in Table).								
^c Includes beef, chicken, lamb, pork, veal, fish, shellfish, game, and organ meats.								
^d Includes baby food dinners, chili, egg dishes, pizza, macaroni and cheese, TV dinners, sandwiches, spaghetti, and other mixed dishes.								
^e RTE=ready-to-eat cereals.								

do not follow the same children's intakes at different ages, they do provide insight into the possible impact on both nutrient intake and food group consumption among infants and toddlers who consume more energy vs less energy from table foods. To address patterns of food consumption, this analysis focuses on the percentage of children consuming foods from the various food groups rather than the amounts of foods consumed. However, the mean intakes of nutrients shown in Table 2 reflect both food choices and the amounts of foods.

The higher total energy intakes seen in the highest quartile of energy from table foods observed in the nine- to 18-month age groups might be a result of the consumption of energy-dense table foods or simply the consumption of more food, or both (Table 2). In general, the mean intake of total grams of food followed energy intake patterns with the exception of toddlers ages 19 to 24 months.

Toddlers 19 to 24 months in the lowest quartile of table food intake consumed significantly more grams of foods, but about the same level of calories as toddlers in the highest quartile of table food intake, suggesting a higher consumption of energy-dense food items among those who consume more table food energy (Table 5). We investigated whether these higher energy intakes in the higher table food groups were accounted for by differences in age or weight and found no such differences, indicating either that the observed food and nutrient intakes were related to the proportion of energy from table foods and the selection of table foods or that intakes of table food may have been over reported. The FITS infants and toddlers in all age groups consumed, on average, more energy than the current recommendations indicate is appropriate. It is possible that the finding of high energy intakes seen may be due to over reporting of food intake or an under-

Table 4. Percentage consuming different types of fruits and vegetables in the lowest and highest quartiles of energy from table foods^{a,b}

	9-11 Months		12-14 Months		15-18 Months		19-24 Months	
	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile
Quartile cutoff level for percentage of energy from table foods^a	≤8	≥39	≤37	≥62	≤49	≥70	≤55	≥73
Fruits (% consuming)								
Any type of fruit (not juice)	73	70	66	85	67	72	70	63
Baby food	66	11	32	3	11	0	3	1
Nonbaby food	10	66	45	85	60	72	68	63
Canned	5	33	22	35	21	28	27	15
Dried	0	4	1	6	1	10	9	10
Fresh	7	48	33	71	50	63	55	54
100% fruit juice	50	57	62	56	60	72	70	63
Vegetables (% consuming)								
Any type	65	76	77	80	76	87	74	87
Baby food	60	7	32	0	9	0	3	0
Cooked	10	71	53	79	71	83	67	83
Raw	0	7	5	9	12	15	11	19
Total dark green ^c	<1	8	3	9	8	11	4	14
Total deep yellow ^d	33	19	32	11	16	16	9	12
Total starchy ^e	15	22	16	19	18	25	21	21
Total potatoes	8	35	26	40	33	47	33	41
French fries	2	15	8	17	12	26	15	26
Total other ^f	26	41	34	43	48	55	39	45
Sample size ^b	194	149	100	91	74	78	73	85

Data from 2002 Feeding Infants and Toddlers Study (FITS).

^aTable foods exclude baby foods and all beverages (breast milk, infant formula, cow's milk, baby beverages, and nonbaby beverages).

^bTabulations based on weighted data (unweighted sample size reported in Table).

^cIncludes broccoli, spinach, other greens, and romaine lettuce. Totals include both commercial baby foods and table foods.

^dIncludes carrots, pumpkin, sweet potatoes, and winter squash. Totals include both commercial baby foods and table foods.

^eIncludes corn, green peas, immature lima beans, black-eyed peas (not dried), cassava, and rutabaga. Totals include both commercial baby foods and table foods.

^fOther vegetables include string beans, tomato sauce, and other vegetables not included in other categories shown. Totals include both commercial baby foods and table foods.

estimate of calculated Estimated Energy Requirements (EER) based on reported body weights or both, as detailed in the paper by Devaney and colleagues (10).

Because 10% of two- to five-year-old children are overweight, defined as at or above the 95th percentile of body mass index for age, there is increasing concern about the higher rates of overweight and obesity seen in the preschool and young childhood ages (15). An enormous amount of learning about food occurs during the transition from an all-milk diet to the varied diet of the family (16). Individual differences in self-regulation of energy intake occur at least as early as the preschool period, and these differences are associated with differences in child feeding practices (16). The pioneering work of Clara Davis on the self-selection of diet by healthy toddlers concluded that children should be offered food only of high nutritional value and that, in young children, appetite is a reasonable guide to the amount offered (17). During this important transition, it is important for parents and caregivers to moderate feeding of energy-dense foods, especially those low in micronutrients, and not to overfeed.

The significantly lower iron intakes seen in nine- to 11-month-old infants getting more of their energy from table foods may be the result of fewer children in this group consuming iron-fortified infant cereals and for-

mula. Those in the higher table food group were more likely to be consuming meats and ready-to-eat cereals high in iron, compared with infant cereals and iron-fortified formula in the lower table food group. With the high prevalence of iron deficiency documented among one- to four-year-old children, this is a vulnerable period in which adequate iron intake is critical (2-4).

Lower calcium intakes were seen in the 15- to 18-month and 19- to 24-month age groups with increased energy from table foods. A lower percentage of children in the high table food groups were consuming milk vs those in the lower table food groups, likely accounting for this difference. At 15 to 18 months, a higher proportion of children in the higher vs lower table food groups were consuming sweetened beverages, and, in the 19- to 24-month group, a large proportion of both groups were consuming sweetened beverages. As others have pointed out (11,18) this is a disturbing trend and may pave the way for the development of the detrimental habit to choose soft drinks and sweetened beverages rather than milk. This practice could lead to the inadequate calcium intakes seen in large segments of the population of older children and adolescents (6-8).

One longitudinal study has shown that the foods children prefer do not change significantly between ages two to three years and eight years and that parents are key

Table 5. Percentage consuming different types of sweets, sweetened beverages, and snacks in the lowest and highest quartiles of energy from table foods^{a,b}

	9-11 Months		12-14 Months		15-18 Months		19-24 Months	
	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile	Lowest quartile	Highest quartile
Quartile cutoff level for percentage of energy from table foods^a	≤8	≥39	≤37	≥62	≤49	≥70	≤55	≥73
All sweets (% consuming)								
All types of sweets ^c	51	70	65	82	76	92	84	90
Cakes, pies, cookies	25	52	37	46	46	57	40	52
Baby cookies ^d	18	17	15	11	9	19	13	11
Other cookies	7	34	21	34	40	41	26	43
Sweet rolls, doughnuts, muffins	0	6	0	3	5	10	8	13
Candy	2	8	3	10	11	15	16	20
Ice cream, frozen yogurt	2	18	10	13	7	23	15	23
All sweetened beverages ^e	6	17	15	29	17	45	42	43
Carbonated sodas	<1	4	3	8	4	8	8	8
Fruit-flavored drinks	5	13	12	22	13	37	37	33
Other	0	1	4	1	3	7	2	3
Snacks (% consuming)								
Chips and salty snacks ^f	3	13	12	20	17	24	22	29
Sample size ^b	194	149	100	91	74	78	73	85
Data from 2002 Feeding Infants and Toddlers Study (FITS).								
^a Table foods exclude baby foods and all beverages (breast milk, infant formula, cow's milk, baby beverages, and nonbaby beverages).								
^b Tabulations based on weighted data (unweighted sample size reported in table).								
^c Includes desserts, sweets, ice cream, and all sweetened beverages.								
^d Includes zweiback, teething biscuits, and animal crackers.								
^e Includes carbonated soda, fruit-flavored drinks (including 10% juice drinks), and other sweetened beverages such as iced tea.								
^f Includes corn chips, potato chips, cheese puffs, and cheese curls. Excludes crackers.								

influencers in the development of children's food preferences (19). Early exposure to fruits and vegetables or to foods high in energy, sugar, and fat has been related to children's preference for and consumption of these foods (20). Although many factors can influence food choices and food habits can change over a lifetime, a foundation for healthy food habits can be created in childhood (21).

A diet high in fruits and vegetables has been shown to be associated with reduced risk of several chronic diseases later in life (22). It is well documented that most children do not meet the recommendation of five servings of fruits and vegetables a day, and a large proportion of their vegetable consumption (25%) is in the form of french fries (23,24). In the FITS data, we have seen this trend beginning as early as ages nine to 11 months, and it appears to happen in those children consuming more energy from table food at an earlier age. The transition to table foods provides an opportunity to introduce infants and toddlers to a variety of forms and types of fruits and vegetables. Serving pureed vegetables and very soft vegetable dices may be an important way to keep a variety of vegetables in a baby's diet before he or she has the feeding skills to handle a wider variety of table food vegetables. It is important to emphasize to parents the fundamental role that fruits and vegetables play in a healthy diet.

Although there were specific differences in the intakes of some nutrients for children in the higher vs lower table food groups, generally both groups of children met their nutrient requirements. With the plethora of fortified

foods available, it is easier than ever to meet micronutrient requirements. Micronutrient intakes among children of all ages have been improving, but, of the five food groups, children are the most likely to have low consumption of fruits and vegetables (8,25). The current data from the FITS support the observed trend of adequate micronutrient intakes, but a significant percentage of toddlers consumed no fruits or vegetables on the intake day. More guidance is needed on the timing of the various transitions, how to transition, which foods to emphasize, and which foods to moderate as the child progresses toward family fare.

The critical period between nine and 24 months of age when the child is transitioning from the all-milk diet to the family diet is also the period when children are acquiring many self-feeding skills (26). Moving to a high proportion of energy from table foods before an infant has the self-feeding skills to handle the wide variety of harder and more complex textures may lead to the feeding of fewer foods and a less varied, less balanced diet. To confirm this, further research needs to be done on the amounts and variety of foods that are consumed from different food groups as a child consumes more energy from table food at various stages of development.

APPLICATIONS

During the transition to table foods, parents should be counseled to continue to offer a wide variety of nutritious foods, particularly fruits and vegetables, in forms

that are developmentally appropriate for the child. Parents should be reminded that the second year of life is a vulnerable period for the development of iron deficiency and to continue to feed foods that are good sources of iron, such as iron-fortified infant cereals, ready-to-eat cereals, other grain products that are high in iron, and meats. In addition, parents should ensure adequate calcium intake and build the habit of consuming milk by providing adequate milk and dairy foods. One strategy is to serve milk with every meal. Teaching children to recognize hunger and satiety cues is also important. Parents can do this by feeding the child when hungry, not forcing or bribing children to eat, and stopping when the child indicates that he or she is full.

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