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Quality of Children's Diets At and Away From Home: 1994-96

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The popularity of eating out is a growing threat to the nutritional quality of children's diets. American children typically eat too much fat, saturated fat, and sodium, and not enough fiber and calcium. Foods kids eat away from home are even higher in fat, saturated fat, and sodium and lower in cholesterol, fiber, calcium, and iron than foods eaten at home. The exception is school foods, which provide higher amounts of fiber and calcium than all other foods. Children of all ages and both genders eat too much fat and saturated fat, but some dietary deficiencies vary by age and gender: excessive intake of cholesterol and sodium is a problem facing many male teens while female teens face insufficient intake of iron and calcium.

This information is obtained from USDA's 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII), which collects information on what, when, where, and how much Americans eat. Data are collected from a nationwide sample, which yields results generalizable to the American population. USDA's Agricultural Research Service (ARS) maintains a nutrient database,

which is used to calculate the amount of nutrients in each food eaten. This article analyzes 1-day individual intakes for children age 2 to 19. Older children no longer in school were excluded from the analysis, as were pregnant or lactating females. Children were grouped into six categories according to their gender and age. In total, this analysis included 4,780 children, representing 62 million children in the United States during 1994-96.

We define away-from-home and home foods according to where the foods are obtained, not where they are eaten. Food at home consists of foods purchased at retail stores, such as the grocery store or supermarket. Food away from home consists of foods obtained from foodservice and entertainment establishments. Away-from-home foods are classified into four groups: "restaurants," or places with waiter service; "fast food," those self-service and carry-out eating places and cafeterias; "schools," including daycare centers and summer camps; and "others," which include vending machines, community feeding programs, and someone else's home. Meals and snacks combining away-from-home and home foods are classified according to the component that contributes the most calories to that particular eating occasion.

Older Children Eat Less Often

During 1994-96, children ate an average of 2.8 meals and 1.8 snacks each day (table 1). Boys and girls ate a similar number of meals and snacks. Older children ate fewer meals and snacks each day. For example, girls age 2-5 ate 2.9 meals and 2.2 snacks each day, compared with 2.6 meals and 1.7 snacks consumed by girls 12-19.

On average, food away from home accounted for slightly less than one in every three meals consumed by children. Preschoolers favored fast-food places, which served 35 and 39 percent of away-from-home meals to preschool boys and girls, respectively. Once they began attending elementary schools, children obtained more of their away-from-home meals at schools than at fast-food places, 44 percent compared with 29 percent. School meals became less attractive to children in middle and high schools, and their contribution to meals away from home dropped to 32 percent. Differences in preferences become more apparent among older children, also. For example, male teens¹ clearly favored fast foods, and ate 2 out of 5 away-from-home meals at fast-food places, while

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¹Although this age group also includes children 12 years old, for simplicity they will be referred to as "teens."

female teens tended to frequent a variety of places, including restaurants (14 percent of their away-from-home meals) and others (23 percent of their away-from-home meals).

On average, one in every five snacks was eaten away from home. "Others" (which include snacks obtained from a vending machine or eaten at someone else's home) were by far the most popular sources of snacks, accounting for over 60 percent of all away-from-home snacks eaten by children. Among preschoolers, day-care centers and preschools accounted for one in every three away-from-home

snacks. Children in elementary schools equally favored snacking at schools and fast-food places, whereas older children favored snacking at fast-food places over schools.

Children ate 26 percent of their total meals and snacks away from home and obtained 32 percent of food calories from away-from-home foods (table 1). This suggests that children either eat larger amounts when they eat out and/or eat higher calorie foods. Fast-food places provided 7 percent of all meals and snacks eaten by children, and contributed 10 percent of total calories. Schools provided about 8 percent of

all meals and snacks and contributed 9 percent of total calories. On average, restaurants contributed very little to children's caloric intake—only 4 percent of daily calories.

Comparing Nutritional Quality of Foods

We compared the nutritional quality of foods from various sources using the nutrient-to-calorie (or nutrient) density, which measures the amount of a nutrient or food component for each 1,000 calories of that food. Because dietary recommendations for fat and saturated fat

Table 1
Children in Elementary Schools Ate More Meals at Schools Than Other Away-From-Home Places

Item	All children and up			Age 2 - 5		Age 6 - 11		Age 12	
	All	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
<i>Number</i>									
Meals per day	2.8	2.8	2.8	2.9	2.9	2.8	2.8	2.6	2.6
Snacks per day	1.8	1.8	1.8	2.1	2.2	1.8	1.7	1.7	1.7
<i>Percent</i>									
Meals									
At home	70	70	70	77	78	69	68	65	66
Away from home	30	30	30	23	22	31	32	35	34
Fast food ¹	33	35	31	35	39	29	29	40	29
Schools ¹	36	36	35	27	24	44	44	32	32
Restaurants ¹	11	10	11	14	11	11	7	9	14
Others ¹	19	17	22	23	26	15	18	15	23
Snacks									
At home	80	81	78	83	82	80	79	81	75
Away from home	20	19	22	17	18	20	21	19	25
Fast food ¹	17	18	16	11	13	19	16	21	19
Schools ¹	18	19	18	31	35	19	16	9	7
Restaurants ¹	4	4	3	5	1	3	2	5	7
Others ¹	61	60	63	52	52	59	66	65	67
Calorie distribution									
At home	68	68	68	76	76	69	66	65	65
Away from home	32	32	32	24	24	31	34	35	35
Fast food ²	10	11	9	7	7	9	9	15	10
Schools ²	9	9	9	7	7	11	12	9	8
Restaurants ²	4	4	3	3	2	4	3	4	5
Others ²	9	8	10	7	7	7	10	8	11

Notes: ¹Percent of away-from-home meals and snacks. ²Percent of total calories. Source: Compiled by USDA's Economic Research Service from the 1994-96 CSFII, 1-day intake.

are expressed as a percentage of total calories consumed, we used the proportion of total calories that come from fat and from saturated fat as measures of the fat and saturated fat densities.

For each nutrient or food component we also derived a "benchmark" density. Obtained by dividing the recommendation for a given nutrient or food component by an individual's reported caloric intake in 1,000 calories, the benchmark density represents the nutrient density necessary for an individual's diet to meet the dietary recommendation at that caloric intake level. The benchmark density for a particular nutrient will be lower (higher) than the nutrient density when that nutrient is consumed in amounts higher (lower) than the recommended levels. We used dietary recommendations from the *Dietary Guidelines for Americans* (USDA/DHHS, 1995) and other health authorities to derive the benchmark densities for seven nutrients and dietary components: fat, saturated fat, cholesterol, sodium, fiber, calcium, and iron. We calculated benchmark densities for specific population groups by dividing the sum of the recommended intakes for all people in the group by the sum of their reported caloric intakes.

Too Much Fat

According to the *Dietary Guidelines for Americans*, fat intake should not exceed 30 percent of total calories and saturated fat should be less than 10 percent of total calories—the benchmark densities for fat and saturated fat. Foods consumed by children during 1994-96 contained 33 percent of calories from fat and 12 percent of calories from saturated fat (table 2). Consequently, only 36 and 31 percent of all children met

the recommended intake for fat and saturated fat, respectively (table 3).

In 1994-96, away-from-home foods had, on average, higher fat and saturated fat densities than home foods (table 2). Home foods consumed by all children contained 31.5 percent of calories from fat and 11.5 percent of calories from saturated fat, compared with 36.2 percent of calories from fat and 13.2 percent of calories from saturated fat for away-from-home foods. The higher fat and saturated fat densities for away-from-home foods occurred for all age/gender groups (table 4).

Restaurant and fast foods had a higher fat density than school foods for all age/gender groups, except for boys 12-19 who obtained 38.5 percent of calories from fat from school foods. In contrast, the saturated fat density of school foods was higher or similar to the saturated fat density of restaurant foods or fast foods, except among preschool girls.

USDA's *School Meals Initiative for Healthy Children* of 1994 aims to lower the high fat and high saturated fat content of school meals. Since the initiative was not implemented until fall of 1996 and many schools received permission to delay its implementation, the effects of the initiative will not be more fully understood until more current data are available.

Restaurant Foods High in Cholesterol, Sodium

Many health authorities recommend that daily cholesterol intake should not exceed 300 milligrams (mg). The U.S. Food and Drug Administration (FDA) uses this recommendation to set the Daily Value for nutrition labeling (Kurtzweil, 1993).

Although home foods, on average, had a higher cholesterol density than away-from-home foods, the

cholesterol density among the different sources of away-from-home foods varies widely. Home foods averaged 118 mg of cholesterol per 1,000 calories, compared with 107 mg of cholesterol per 1,000 calories for away-from-home foods (table 2). However, restaurant foods averaged 144 mg of cholesterol per 1,000 calories, 43 percent higher than the cholesterol density of fast foods. Regardless of source, cholesterol densities were considerably lower than the benchmark density, resulting in 77 percent of all children (74 percent for boys and 81 percent for girls) meeting the recommended cholesterol intake (table 3).

Interestingly, restaurant foods consumed by girls 6-11 had the highest cholesterol density of all, 163 mg of cholesterol per 1,000 calories, followed by restaurant foods consumed by girls 12-19, with 154 mg of cholesterol per 1,000 calories (table 4). Both of these cholesterol densities were slightly lower than the benchmark density for each group, so that 82 percent of girls 6-11 and 78 percent of girls 12-19 met the recommended intake for cholesterol. In contrast, the 137 mg of cholesterol per 1,000 calories provided by restaurant foods eaten by boys 12-19 was substantially higher than their benchmark density of 110 mg of cholesterol per 1,000 calories. Because older boys tend to consume more calories than other children, they are more likely to exceed the recommended cholesterol intake, which is fixed regardless of total caloric intake. During 1994-96, more than one in every three boys 12-19 exceeded the recommended intake for cholesterol.

The National Academy of Sciences' *Diet and Health* recommends an upper limit of 2,400 mg of sodium per day, regardless of age

and gender (National Research Council, 1989). The sodium density is similar for home foods (1,568 mg per 1,000 calories) and away-from-home foods (1,590 mg), and both are substantially higher than the benchmark density of 1,224 mg for all children (table 2). During 1994-96, only 39 percent of all children met the recommended sodium intake (table 3).

Although sodium densities varied greatly within each age/gender group—from a low of 1,423 mg to a high of 1,962 mg per 1,000 calories—restaurant foods typically provided

the highest sodium densities. Except among girls 2-5, the sodium density of children's diets exceeded the benchmark (table 4). Although most children need to pay attention to the sodium level in foods they eat at and away from home, the problem is particularly severe for male teens, since their higher calorie consumption results in a particularly low sodium benchmark density. Male teens ate an average of 1,590 mg of sodium per 1,000 calories, 80 percent higher than their benchmark density of 880 mg of sodium per 1,000 calories.

School Foods Lead in Fiber, Calcium

The American Health Foundation recommends a dietary fiber intake of "age plus five" for children 2 and older (Williams). With an average intake of 1,961 calories per day reported during 1994-96, the benchmark fiber density for all children was 7.3 grams per 1,000 calories. The fiber density in foods eaten by children during 1994-96 averaged 6.7 grams per 1,000 calories, resulting in only 39 percent of all children meeting the recommended fiber

Table 2
Too Much Fat, Saturated Fat, and Sodium, and Too Little Fiber and Calcium in Children's Diets

Food outlets for children	Total fat	Saturated fat	Cholesterol	Sodium	Fiber	Calcium	Iron
	Percent of calories						
All children ¹ —							
Home foods	31.5	11.5	118	1,568	6.9	474	8.3
Away-from-home foods	36.2	13.2	107	1,590	6.2	438	6.0
Fast food	38.2	13.7	101	1,609	5.6	359	5.9
Schools	36.4	14.5	103	1,609	7.1	665	6.2
Restaurants	38.4	12.7	144	1,723	6.2	344	6.0
Others	32.8	11.7	101	1,493	5.8	331	5.9
All foods	33.0	12.0	115	1,575	6.7	463	7.6
Benchmark	30.0	10.0	153	1,224	7.3	530	5.8
Boys—							
Home foods	31.7	11.5	118	1,563	6.8	473	8.5
Away-from-home foods	36.6	13.4	108	1,605	6.1	438	6.0
Fast food	38.3	13.7	102	1,609	5.4	356	6.0
Schools	36.9	14.8	106	1,630	7.0	671	6.1
Restaurants	38.5	12.4	137	1,759	6.6	334	6.2
Others	32.9	11.9	105	1,497	5.8	326	5.9
All foods	33.3	12.1	115	1,576	6.6	462	7.7
Benchmark	30.0	10.0	139	1,110	6.7	481	5.0
Girls—							
Home foods	31.3	11.4	119	1,575	7.0	474	8.1
Away-from-home foods	35.7	13.0	106	1,570	6.3	439	6.0
Fast food	38.1	13.6	101	1,608	6.0	364	5.9
Schools	35.8	14.0	100	1,581	7.3	658	6.3
Restaurants	38.4	13.2	153	1,672	5.7	359	5.8
Others	32.7	11.5	98	1,489	5.9	335	5.9
All foods	32.7	11.9	115	1,573	6.8	463	7.5
Benchmark	30.0	10.0	172	1,373	8.2	593	6.9

Notes: ¹Included those age 2 to 19 and older children who were still attending schools, excluded those who were pregnant or lactating. Source: Compiled by USDA's Economic Research Service from the 1994-96 CSFII, 1-day intake.

(table 2). As a result, only 37 percent of all children (42 percent of boys and 32 percent of girls) met their recommended calcium intake (table 3). Home foods were more dense in calcium (474 mg) than away-from-home foods (438 mg). As with fiber, school foods had the highest calcium density of all, 665 mg per 1,000 calories.

Similar to the fiber situation, as children age their diets become more calcium deficient and the deficiency is worse among girls than boys. However, unlike fiber, the problem is due to both a declining calcium density in the diet as well as increasing requirements. Foods eaten by preschool girls contained 537 mg of calcium per 1,000 calories (567 mg for home foods and 439 mg for away-from-home foods), which was higher than the benchmark of 444 mg of calcium per 1,000 calories (table 4). More than 60 percent of preschool girls met the recommended calcium intake.

Foods eaten at home by girls 6-11 contained 460 mg of calcium, and thanks to calcium-rich school foods (764 mg), away-from-home foods eaten by girls 6-11 contained 498 mg of calcium per 1,000 calories (table 4). Less than one in three girls 6-11

met their recommended calcium intake (table 3). When girls reached their teens, they choose foods less rich in calcium: the calcium density dropped to 426 mg for home foods, 381 mg for away-from-home foods, and 504 mg for school foods (fig. 1). Consequently, less than one in every six female teens met the recommended calcium intake.

Female Teens Need More Iron

The recommended daily allowances (RDA) for iron are 12 mg for males 11-18, 15 mg for females 11-50, and 10 mg for others 2 and older (National Research Council, 1989). During 1994-96, foods consumed by children had an average iron density of 7.6 mg per 1,000 calories, or 31 percent above the benchmark 5.8 mg (table 2). Close to 60 percent of all children met their recommended iron intake (table 3). Home foods were much more iron-dense than away-from-home foods (8.3 mg versus 6.0 mg) for all age/gender groups.

Female teens have the highest recommended iron intake of all children, and yet their foods contained the least amount of iron. The bench-

mark iron density was 7.9 mg per 1,000 calories for female teens, compared with 4.4 mg for male teens and 6.0 mg for girls 6-11. Home foods eaten by female teens contained 7.9 mg of iron (compared with 8.3 mg for girls 6-11) and away-from-home foods had 5.7 mg of iron (6.2 mg for girls 6-11). Consequently, only one in every three female teens met the recommended iron intake.

Choosing Foods More Wisely

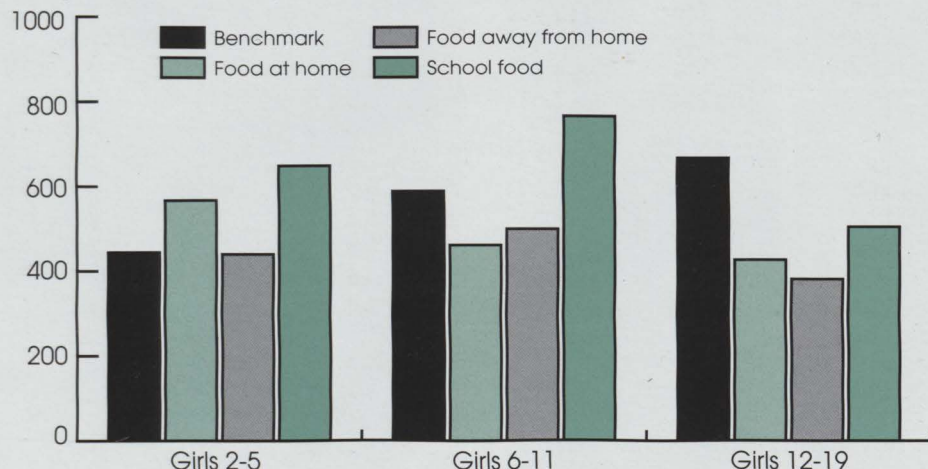
There are two basic challenges to improve children's diets: increasing intakes of some nutrients and food components like fiber, calcium, and iron while limiting others like fat, saturated fat, cholesterol, and sodium. Away-from-home foods generally contained more of the over-consumed nutrients and food components and less of the under-consumed nutrients and food components than home foods.

Food away from home plays an increasingly important role in determining the nutritional quality of children's diets. Away-from-home foods contributed 20 percent of total calories consumed by children in 1977, rising to 32 percent during 1994-96. Children and their parents need to realize the importance of away-from-home foods in the overall diet; away-from-home foods are no longer the occasional treats they were two decades ago. Furthermore, since the increased trend toward eating out is expected to continue, nutrition policy, education, and promotion strategies need to stress making wise food choices when eating out.

Overall dietary quality tends to decline as children get older. Preschool boys had diets that compared favorably with benchmark densities for cholesterol, fiber, calcium, and iron. Among preschool

Figure 1
Older Girls Need More Calcium, Yet Female Teens Consume Foods Least Rich in Calcium

Milligrams of calcium per 1,000 calories



girls, diets met benchmark densities for those nutrients and also for sodium. Among teenagers, however, boys met the benchmark density only for iron, whereas girls met it only for cholesterol. Other studies have found similar declines; for example, using the Healthy Eating Index (HEI), USDA researchers found that diets were best in very young children, and declined in adolescence and young adulthood. Diets eventually improved again among older adults, but, since diet-related chronic diseases are products of lifetime eating habits, this

late improvement should not be viewed with complacency. The increase in eating out that occurs as children get older appears to be a factor in the age-related decline in diet quality. Research is needed to identify other reasons why dietary quality declines during childhood and adolescence and to discover effective strategies to stem that decline.

Comparing diets with benchmark densities also demonstrates some differences among dietary improvement needs among age-gender groups. Whereas excessive intakes

of fat and saturated fat occur among all children, teens face additional dietary problems. Teen girls, despite having the greatest needs for calcium and iron, have the least nutrient-dense diets for these nutrients. Male teens are the most likely group to have excessive intakes of cholesterol and sodium. These findings indicate that broad messages appropriate for all audiences need to be supplemented with targeted messages designed to reach high-needs groups. One example is the "Crash Course on Calcium" nutrition education program that the National

Table 4
Female Teens' Diets Need More Iron and Calcium, While Male Teens Need Less Cholesterol and Sodium

Food outlets for children ¹	Total fat	Saturated fat	Cholesterol	Sodium	Fiber	Calcium	Iron
	Percent of calories		Mg		Grams	Mg	
Boys 2-5:							
Home foods	31.5	12.0	122	1,520	6.9	539	8.4
Away-from-home foods	36.5	13.5	109	1,631	6.6	462	6.4
Fast food	37.8	13.5	94	1,577	5.4	379	5.9
Schools	34.0	13.6	104	1,600	8.1	665	7.5
Restaurants	39.7	13.5	140	1,938	6.4	367	6.0
Others	36.4	13.5	115	1,582	6.5	384	6.0
All foods	32.7	12.4	119	1,547	6.8	520	7.9
Benchmark	30.0	10.0	190	1,519	5.4	412	6.3
Girls 2-5:							
Home foods	31.7	12.1	127	1,564	6.9	567	8.3
Away-from-home foods	35.5	13.1	114	1,567	6.5	439	6.3
Fast food	39.1	14.0	114	1,627	5.6	352	6.1
Schools	32.3	12.8	109	1,517	7.8	647	6.7
Restaurants	38.6	13.8	130	1,962	6.2	397	6.7
Others	34.1	12.3	113	1,437	6.2	350	6.1
All foods	32.6	12.4	124	1,564	6.8	537	7.8
Benchmark	30.0	10.0	204	1,633	5.8	444	6.8
Boys 6-11:							
Home foods	31.6	11.5	116	1,554	6.8	479	9.0
Away-from-home foods	36.2	13.4	105	1,619	6.4	477	6.2
Fast food	38.3	13.6	99	1,655	5.3	342	6.0
Schools	36.2	14.8	111	1,630	7.5	724	6.1
Restaurants	38.3	12.8	136	1,626	5.4	319	6.0
Others	32.6	11.6	87	1,557	6.5	346	6.6
All foods	33.0	12.1	113	1,575	6.7	478	8.1
Benchmark	30.0	10.0	148	1,186	6.7	525	5.1

Continued—

Institute of Child Health and Human Development launched in partnership with a coalition of government, private sector, and medical groups. This program targets teen girls by using role models such as young female Olympic athletes in the popular "milk moustache" campaign. A similar program targeting cholesterol and sodium intake might be useful for teen boys.

Different approaches are needed to address different age groups and different sources of away-from-home foods. For example, although school foods contributed an average

of 9 percent of children's total calories during 1994-96, the importance of school foods to a child's diet was highest among children ages 6-11 years. Although school foods tended to be high in fat, saturated fat, and sodium, they also provided the highest amounts of fiber and calcium—nutrients in short supply in most children's diets. In an effort to educate people about healthier diets and better food choices, USDA put forth the School Meals Initiative for Healthy Children. The initiative has devoted considerable resources to developing and disseminating edu-

cational materials for use with food-service staff, students, teachers, parents, and the community.

In 1994-96, fast-food places contributed an average of 10 percent of children's total calories. The contribution rises with children's age, from 7 percent among preschoolers to 15 percent among teen boys. Fast foods consumed by children were relatively high in fat, saturated fat, and sodium, and low in fiber and calcium, compared with home foods. The nutritional composition of fast foods is most likely to be influenced by consumer demand.

Table 4
Female Teens' Diets Need More Iron and Calcium, While Male Teens Need Less Cholesterol and Sodium—Continued

Food outlets for children ¹	Total fat	Saturated fat	Cholesterol	Sodium	Fiber	Calcium	Iron
	Percent of calories		—Mg—		Grams	—Mg—	
Girls 6-11:							
Home foods	31.6	11.4	114	1,548	7.0	460	8.3
Away-from-home foods	35.6	13.4	104	1,564	6.3	498	6.2
Fast food	37.5	13.3	91	1,580	6.1	363	5.7
Schools	35.6	14.5	105	1,620	7.7	764	6.8
Restaurants	37.3	12.8	163	1,641	5.1	368	5.6
Others	33.4	12.2	100	1,463	5.4	343	6.1
All foods	32.9	12.0	111	1,553	6.7	473	7.6
Benchmark	30.0	10.0	166	1,326	7.5	587	6.0
Boys 12-19:							
Home foods	31.9	11.2	118	1,590	6.6	437	8.1
Away-from-home foods	36.9	13.4	109	1,589	5.7	405	5.8
Fast food	38.4	13.8	105	1,594	5.4	358	6.0
Schools	38.5	15.3	101	1,641	6.3	620	5.6
Restaurants	38.2	11.7	137	1,804	7.7	335	6.5
Others	31.8	11.4	113	1,423	5.0	290	5.3
All foods	33.7	12.0	115	1,590	6.3	426	7.3
Benchmark	30.0	10.0	110	880	7.2	477	4.4
Girls 12-19:							
Home foods	30.8	11.0	118	1,609	7.3	426	7.9
Away-from-home foods	36.0	12.7	103	1,576	6.1	381	5.7
Fast food	38.1	13.8	104	1,625	6.1	370	6.0
Schools	37.8	13.8	891	554	6.4	504	5.3
Restaurants	38.9	13.3	154	1,616	5.8	344	5.7
Others	31.6	10.6	911	531	6.2	322	5.7
All foods	32.6	11.6	113	1,598	6.9	410	7.1
Benchmark	30.0	10.0	158	1,267	10.3	687	7.9

Notes: ¹Included those age 2 to 19 and older children who were still attending schools, excluded those who were pregnant or lactating. Source: Compiled by USDA's Economic Research Service from the 1994-96 CSFII, 1-day intake.

Strategies that promote nutrition need to encourage both parents and children to make the most healthful choices available from among the various menu items and to demand a wider range of nutritious options.

Conclusions

A healthy diet promotes health and prevents disease. Good eating habits ideally should be formed in childhood and adolescence. These habits can last a lifetime—for example, researchers at the National Cancer Institute found that the habit of eating fruits and vegetables since childhood led to higher intakes of those foods in adulthood. Unfortunately, current data suggest that children today are developing less favorable eating habits, and dietary quality actually declines as they grow up. Food choices when eating out may contribute to this decline. Nutrition educators may need to promote healthy eating choices as eating out continues. USDA has taken action to improve the nutritional quality of school meals and to encourage more nutrition education in schools. These efforts should be

helpful; however, effective strategies for improving food choices in other locations, such as fast-food establishments, and for reaching groups of children with especially poor diets, such as teenage girls, are needed.

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