

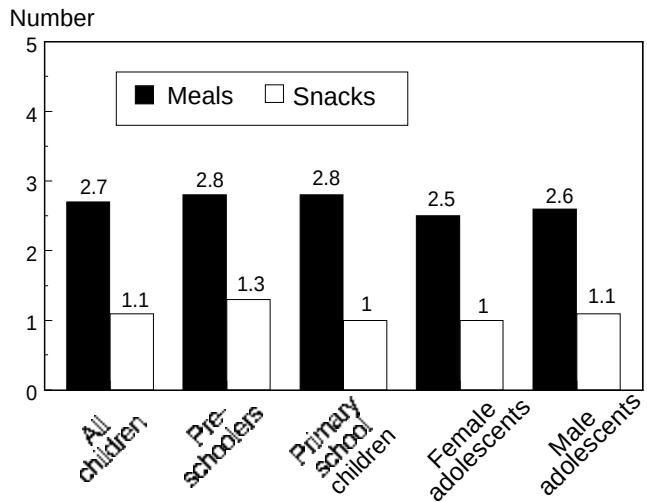
Meal and Snack Eating Patterns

CSFII respondents reported all foods and beverages consumed throughout the day and the associated eating occasion and time. An eating occasion can be a meal (breakfast, brunch, lunch, dinner, or supper) or snack. During 1989-91, the average number of eating occasions was 3.8 (2.7 meals and 1.1 snacks) per day among children 2 to 17 years of age. More than half of all children ate 3 meals each day, and the number of meals decreased with age. Preschoolers had the most meals (2.8) and snacks (1.3) per day (fig. 4), and female adolescents the fewest (2.5 meals and 1.0 snack).

It is common to describe the first eating occasion of the day as breakfast, but brunch, lunch, dinner, and supper are used interchangeably, depending on regional and cultural differences. Meals can be classified on the basis of time or occasion. Meals are categorized here as morning, midday, and evening meals according to the self-reported eating occasion and time. Morning meals include breakfast and brunch eaten before 10 a.m.; midday meals include lunch eaten between 10 a.m. and 3:30 p.m. as well as dinner, or supper eaten before 3:30 p.m.; and evening meals include supper eaten after 3:30 p.m. Foods can be eaten as snacks at any time, and they are treated as a separate occasion. This categorization enables us to find out

Figure 4

Number of meals and snacks eaten by children each day



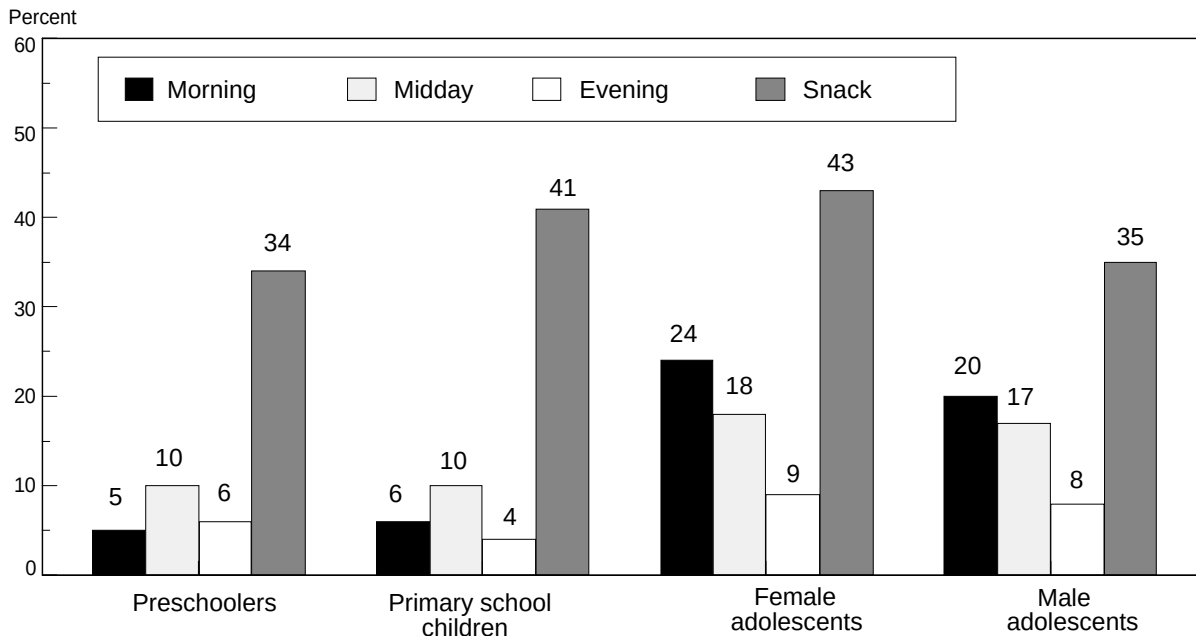
Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted average.

the frequency of skipping (or eating) a particular meal/snack category and the distribution of caloric and nutrient intakes across meal/snack categories.

Different meal patterns emerge as children reach secondary school age (fig. 5). On a given day during the survey period, the percentage of children skipping morning meals increased with age, from 5-6 percent among children age 2-11 to 20-24 percent among

Figure 5

Percentage of children skipping a meal or snack



Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted averages.

adolescents. About 10 percent of children age 2-11 skipped midday meals and 17-18 percent of adolescents skipped midday meals. Relative to morning and midday meals, a smaller percentage of adolescents skipped evening meals. Still, a smaller percentage of adolescents ate evening meals than did younger children.

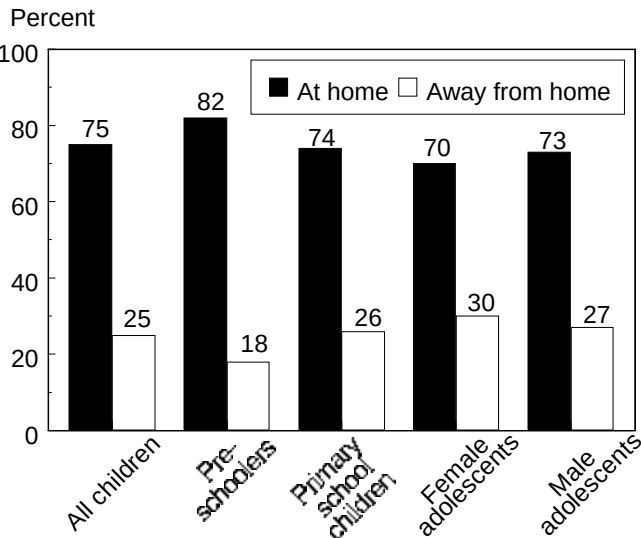
Food Away From Home

Previous research reported conflicting results concerning whether eating out improves or worsens nutritional quality in our diets (Bunch and Hall, 1983; Guenther and Chandler, 1980). The nutritional quality of away-from-home foods may differ from the nutritional quality of home foods for several reasons. The nutrition facts label, now required on most processed foods, can help consumers choose foods lower in fat and sodium and without added sugar. However, the nutrition information requirement is waived for food served for immediate consumption, such as in restaurants and cafeterias, except when a restaurant or cafeteria item carries a health or nutrient claim (such as "low fat," etc.) Consumers have little control over preparation techniques for away-from-home foods. Furthermore, consumers' reaction to their concerns over nutrition may differ between foods at home and away from home. Several fast-food chains introduced reduced-fat hamburgers, but later withdrew them from the menu because they did not sell. And a number of restaurant operators claim that although consumers may say they want healthful foods, they typically order something else (Parseghian, 1992).

Home and away-from-home foods are defined in this study according to where the foods are obtained, not where they are eaten. Both can be eaten at or away from home. The distinction between home and away-from-home foods is related to the degree of control a consumer has over the nutritional content of the food. In CSFII surveys, respondents were asked whether the food item was ever brought home. In this study, away-from-home foods include those items never brought home or brought home from fast-food/carryout places or meals on wheels.

Sources for away-from-home foods are combined into four groups: fast-food places, schools, restaurants, and others. Fast-food places include self-service restaurants, carryout places, cafeterias, and meals on wheels; schools include day-care centers and summer camps; restaurants are those with waiter or waitress service; others include vending machines,

Figure 6
Percentage of meals eaten at home and away from home



Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted averages.

recreation/entertainment places, community feeding programs, and someone's home. A meal or snack sometimes contains both home and away-from-home foods. When this is the case, an eating occasion is classified as at-home if home foods contribute 50 percent or more of total calories consumed during the occasion.

The 1989-91 CSFII data reveal that one-quarter of meals consumed by children age 2-17 were away from home. Older children ate a higher proportion of meals away from home, increasing from 18 percent for preschoolers to 30 percent for female adolescents (fig. 6 and app. table 1).

Fast-food places provided 42 percent of away-from-home meals to preschoolers, followed by other locations with 29 percent, schools (day-care facilities) with 18 percent, and restaurants with 12 percent (fig. 7). As children reach school age, schools provided the most away-from-home meals (36-43 percent), followed by fast-food places (30-32 percent), others (17-22 percent), and restaurants (8-12 percent).

Children ate a higher percentage of snacks at home (83 percent) than meals at home (75 percent) (app. table 1). As with meals, older children ate a higher percentage of snacks from away-from-home sources: 15 percent for 2-11 years old, 18 percent for male adolescents, and 22 percent for female adolescents. Places other than schools, fast food, and restaurants

accounted for more than 50 percent of snacks eaten by all children. For example, eating snacks at recreation and entertainment places, such as movie theaters and ball parks, accounted for 30 percent of snacks eaten at places other than schools, restaurants, and fast-food establishments. For preschoolers, day-care facilities provided 40 percent of away-from-home snacks. As children reach school age, fast-food places became the most popular snack providers.

Food Energy Intakes

The healthy body needs energy for metabolic processes, to support physical activity and growth, and to maintain body temperature. The National Research Council's Recommended Energy Allowances (REA) are based on age, physical activity, body size, and gender. The average 1989 REA's are 1,300, 1,800, and 2,000 calories for children age 1-3, 4-6, and 7-10. For males age 11-14

and 15-18, the recommendations average 2,500 and 3,000 calories, while 2,200 calories are the recommended average intake for females age 11-18.

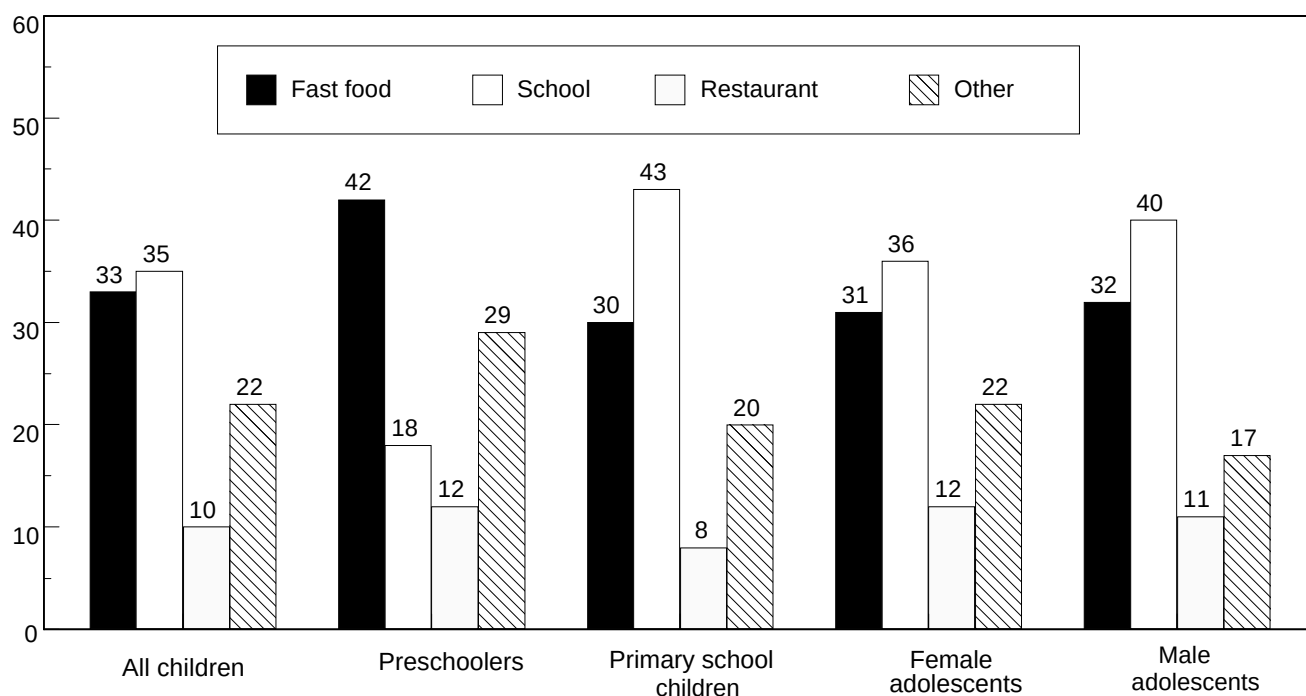
In 1991, researchers in USDA's Agricultural Research Service reported that volunteers in their nutrition studies underreported their caloric intake by an average of 18 percent (Mertz and others, 1991). In addition, the data from the Third National Health and Nutrition Examination Survey (HANES III) conducted by the National Center for Health Statistics also indicate underreporting in food consumption, especially among females and overweight persons (Briefel and others, 1995). Therefore, energy and nutrient intake estimates from dietary recall surveys, such as CSFII, represent a lower limit of actual intakes.

In the 1989-91 CSFII surveys, children's caloric intakes averaged 1,781 calories per day—only 88 percent of their average 1989 REA (fig. 8). Both daily caloric intakes expressed as a percentage of the mean REA and a percentage of children meeting their

Figure 7

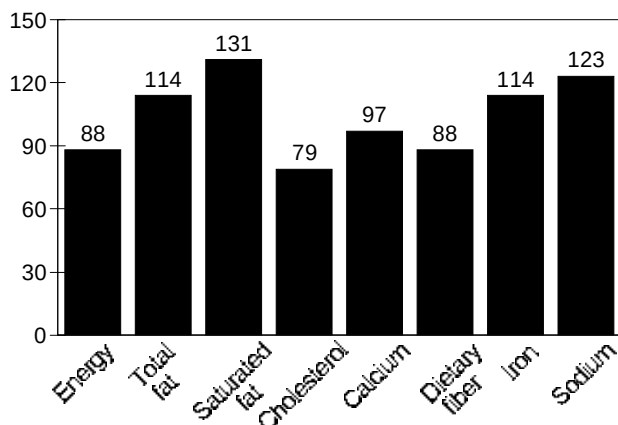
Distribution of away-from-home meals by source

Percent



Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted averages

Figure 8
Average intake as a percentage of recommended levels: all children



Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted averages

mean REA's decreased with age (table 1). Preschoolers, on average, obtained 92 percent of the mean REA and about 34 percent of them met their mean recommended level. Female adolescents achieved 82 percent of the mean REA and only 22 percent of them met the mean recommendation.

Among all children, snacks accounted for 15 percent of total calories, the smallest share among the four meal/snack categories. As the day progressed, children increased their caloric intakes from 21 percent at morning meals to 30 percent at midday meals to 35 percent at evening meals. Older children had a larger share of calories from evening meals at the expense of morning meals, reflecting their relative tendency to skip morning meals (fig. 5). The morning meal's share of daily calories decreased from 23 percent among preschoolers to 21 percent among primary school children to 18-19 percent among adolescents; the evening meal's share of daily calories increased from 32 percent among preschoolers to 35 percent among primary school children to 37 percent among adolescents.

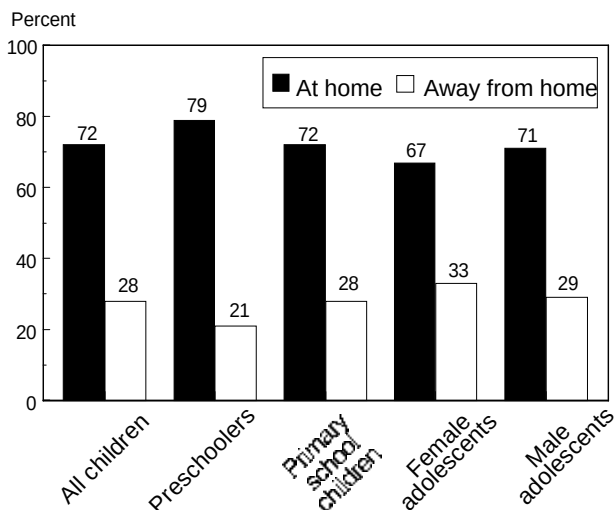
On average, home foods provided nearly three-quarters (72 percent) of food calories to all children (table 2, fig. 9). Older children ate out more often and hence obtained a higher proportion of calories away from home. Preschoolers obtained 21 percent of their food calories away from home.

Primary school children obtained 28 percent and male adolescents obtained 29 percent of their calories away from home.

Female adolescents had the largest share of calories away from home at 33 percent. Fast foods provided 11 percent of food calories to female adolescents, the highest among all children included in this study (table 2). Schools provided children with the most calories among the four away-from-home sources.

While the CSFII data indicate that many children's reported caloric intakes fell below the mean recommended level, overweight has become a significant public health problem for both children and adults in the United States. For example, the prevalence of overweight children and adolescents increased from 5 percent in the 1960's to 11 percent in 1988-91 (Troiano and others, 1995). This inconsistency could be caused, at least partially, by the fact that dietary recall data are subject to considerable underreporting. Furthermore, factors in addition to caloric intake could have contributed to the increased prevalence of overweight. Decreased physical activity and hence decreased energy expenditure is a major contributor to overweight (McPherson and others, 1995). For example, Dietz and Gortmaker (1985) found a positive and significant association between the amount of TV watching and childhood overweight. Attempts to increase physical activity may mitigate this important public health problem (Troiano and others, 1995).

Figure 9
Distribution of food energy: at home and away from home



Compiled by USDA/ERS from CSFII 1989-91, 3-day weighted averages.

Table 1—Daily caloric and selected nutrient intakes of children age 2-17

Calories/nutrient	Unit	Age and gender groups				
		All children	Preschoolers age 2-5	Children age 6-11	Female adolescents age 12-17	Male adolescents age 12-17
Daily intakes:						
Food energy ¹	calories	1,781	1,395	1,796	1,799	2,349
From protein	calories	267	213	268	271	352
From carbohydrate	calories	900	711	911	903	1,174
From total fat	calories	614	473	617	625	823
	percent ²	34.2	33.7	34.3	34.3	34.5
From saturated fat	calories	233	186	236	232	304
	percent ²	13.1	13.3	13.2	12.7	12.9
Cholesterol	mg	236	196	236	234	303
Sodium	mg	2,948	2,274	2,947	3,057	3,926
Calcium	mg	900	800	923	820	1,103
Dietary fiber	grams	11.8	9.1	12.0	11.8	15.3
Iron	mg	12.8	10.4	12.8	12.6	16.8
Intake as percent of recommended levels: ³						
Food energy	percent	88	92	89	82	86
Total fat	percent	114	112	114	114	115
Saturated fat	percent	131	133	132	127	129
Cholesterol	percent	79	65	79	78	101
Sodium	percent	123	95	123	127	164
Calcium	percent	97	100	109	68	92
Dietary fiber	percent	88	108	90	61	79
Iron	percent	114	104	123	84	140
Percent of children meeting the recommended intake level:						
Food energy	percent	30	34	33	22	26
Total fat	percent	22	26	21	20	17
Saturated fat	percent	13	14	11	20	11
Cholesterol	percent	77	86	77	76	64
Sodium	percent	34	60	30	28	10
Calcium	percent	43	47	53	16	38
Dietary fiber	percent	32	53	30	11	24
Iron	percent	54	48	64	21	71

¹ Food energy is sum of calories from protein, carbohydrate, and fat intakes. Calories from protein, carbohydrate, and fat are derived from multiplying grams of intakes by 4, 4, and 9 calories.

² Percent of calories from total or saturated fat.

³ The recommended intakes used in this study are: the National Research Council's Recommended Energy Allowances (REA) for energy and Recommended Daily Allowances (RDA) for calcium and iron; the FDA's Daily Reference Value for sodium (2,400 mg) and cholesterol (less than 300 mg); and the American Health Foundation's "age plus 5" for fiber.

Compiled by USDA/ERS from 1989-91 CSFII, 3-day weighted averages.

Table 2—Distribution of intakes by meal/snack categories and sources

Age/gender/meal category and source	Calories	Total fat	Saturated fat	Cholesterol	Sodium	Fiber	Calcium	Iron
<i>Percent</i>								
Children age 2-17								
Morning meals	21	17	18	29	18	18	30	36
Midday meals	30	31	32	27	32	32	29	23
Evening meals	35	37	36	37	42	38	29	32
Snacks	15	13	14	8	9	12	13	9
Preschoolers								
Morning meals	23	19	21	33	20	21	31	40
Midday meals	30	32	32	27	34	31	28	23
Evening meals	32	33	32	32	38	35	27	27
Snacks	16	14	15	8	8	13	14	10
Primary school children								
Morning meals	21	17	19	30	19	19	30	38
Midday meals	30	32	32	25	32	33	30	23
Evening meals	35	38	37	37	41	37	30	31
Snacks	13	12	13	7	8	11	10	8
Female adolescents								
Morning meals	18	15	17	25	16	16	28	32
Midday meals	30	32	32	29	31	30	31	25
Evening meals	37	38	37	38	43	41	28	34
Snacks	15	13	14	8	10	13	13	9
Male adolescents								
Morning meals	19	16	18	26	17	16	27	32
Midday meals	28	30	30	27	29	30	28	23
Evening meals	37	39	37	39	44	40	30	34
Snacks	16	13	15	8	9	13	15	11
Children age 2-17								
Home foods	72	70	70	74	74	73	74	79
Away from home ¹	28	30	30	26	26	27	26	22
Fast food	8	9	9	7	8	7	6	6
Schools	10	11	12	10	10	12	13	8
Restaurants	2	3	3	3	3	2	2	2
Others	7	7	6	6	6	6	5	5
Preschoolers								
Home foods	79	78	78	82	80	80	83	83
Away from home ¹	21	22	22	18	20	20	17	17
Fast food	6	7	7	5	6	5	4	5
Schools	6	7	7	6	6	7	7	6
Restaurants	2	2	2	2	2	2	1	2
Others	6	6	6	5	6	6	5	5
Primary school children								
Home foods	72	70	69	75	72	72	73	78
Away from home ¹	28	30	31	25	28	28	27	22
Fast food	8	9	8	6	8	7	6	6
Schools	13	14	15	12	12	15	16	10
Restaurants	2	2	2	2	2	2	2	2
Others	6	6	6	5	6	5	4	5
Female adolescents								
Home foods	67	65	64	69	70	69	69	74
Away from home ¹	33	35	36	31	30	31	31	26
Fast food	11	12	12	9	10	10	9	8
Schools	11	12	12	10	10	12	13	8
Restaurants	3	3	3	4	3	3	3	2
Others	9	9	8	8	8	7	6	7
Male adolescents								
Home foods	71	70	68	71	73	73	72	78
Away from home ¹	29	30	32	29	27	27	28	22
Fast food	9	10	10	8	9	7	7	7
Schools	10	12	13	11	10	12	14	8
Restaurants	3	3	3	4	3	2	2	2
Others	7	6	6	6	6	5	5	5

¹ Away from home presents the aggregate of fast foods, schools, restaurants, and others. Compiled by USDA/ERS from 1989-91 CSFII, 3-day weighted averages of observations with complete information on meal categories and food sources.