Family Economics and Nutrition Review

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The Healthy Eating Index, 1994-96

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To assess and monitor the dietary status of Americans, the Center for Nutrition Policy and Promotion has periodically issued the Healthy Eating Index (HEI). The HEI is composed of 10 components: Components 1-5 measure consumption of the five major food groups; components 6 and 7 measure total fat and saturated fat consumption; components 8 and 9 measure total cholesterol and sodium intake; and component 10 measures dietary variety. Each component is assessed in terms of dietary recommendations. The HEI was computed for all people 2 years of age and over and population subgroups using data from the 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII). Most people's diet needs improvement. About 12 percent of the population has a good diet, and 18 percent has a poor diet. Americans especially need to improve their consumption of fruit and milk products. African Americans, people with low income, males age 15 to 18, and those with a high school diploma or less education have lower quality diets. These findings provide an awareness and better understanding of the types of dietary changes needed to improve people's eating patterns.

S ome recent reports have indicated that in 4 of the 10 leading causes of death (cardiovascular disease, certain types of cancer, stroke, and diabetes) in the United States, diet and lack of physical activity are significant contributing factors *(5,12)*. It has been well documented that a healthful diet reduces the risk of chronic diseases such as cardiovascular disease and certain forms of cancer *(8,17)*. A study using a healthy diet indicator, based on the World Health Organization's dietary recommendations, found that mortality was lowest in people with the most healthful diets *(6)*. Major improvements in the American public's health can, therefore, be made by improving the dietary patterns of people.

To assess the dietary status of Americans and monitor changes in these patterns, the U.S. Department of Agriculture's (USDA) Center for Nutrition Policy and Promotion (CNPP) developed the Healthy Eating Index (HEI) based on

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Figure 1. Components of the Healthy Eating Index

Components 1-5 measure the degree to which a person's diet conforms to USDA's Food Guide Pyramid serving recommendations for the grains, vegetables, fruits, milk, and meat food groups.

Component 6 measures total fat consumption as a percentage of total food energy intake.

Component 7 measures saturated fat consumption as a percentage of total food energy intake.

Component 8 measures total cholesterol intake.

Component 9 measures total sodium intake.

Component 10 examines the variety in a person's diet.

(Pie chart labels: Total Fat; Saturated Fat; Cholesterol; Sodium; Variety; The Food Guide Pyramid)

the work of Kennedy et al. *(7)* and first computed the Index using 1989 data. The HEI is a summary measure of people's overall diet quality (broadly defined in terms of adequacy, moderation, and variety). The Index consists of scores for consumption of the suggested number of servings of each of the five major Food Guide Pyramid food groups *(15)*; intake of total fat, saturated fat, cholesterol, and sodium; and a measure of dietary variety (fig. 1). The HEI is the only index issued by the Federal Government, and computed on a regular basis, that gauges overall diet quality of the population. According to the American Dietetic Association, the Index is "The most accurate measurement to date on how Americans eat" *(1)*.

This article presents the HEI for 1994-96—the most recent years for which nationally representative data are available to compute the Index. The HEI is calculated for the general population and selected subgroups. CNPP also compares the 1996 HEI with the 1989 HEI to examine possible trends in the diets of Americans.

Components of the Healthy Eating Index

The Healthy Eating Index provides an overall picture of the types and quantity of foods people eat, their compliance with specific dietary recommendations, and the variety in their diets. The total Index score is the sum of 10 dietary components, weighted equally (table 1). The maximum overall HEI score is 100. The 10 components represent various aspects of a healthful diet.

- Components 1-5 measure the degree to which a person's diet conforms to the USDA Food Guide Pyramid serving recommendations for the five major food groups: Grains (bread, cereal, rice, and pasta), vegetables, fruits, milk (milk, yogurt, and cheese), and meat (meat, poultry, fish, dry beans, eggs, and nuts).

- Component 6 measures total fat consumption as a percentage of total food energy (calorie) intake.

- Component 7 measures saturated fat consumption as a percentage of total food energy intake.

- Component 8 measures total cholesterol intake.

- Component 9 measures total sodium intake.

- Component 10 measures the variety in a person's diet.

Table 1. Components of the Healthy Eating Index and scoring system

	Score Ranges[1]	Criteria for Maximum Score of 10	Criteria for Minimum Score of 0
Grain consumption	0 to 10	6 - 11 servings[2]	0 servings
Vegetable consumption	0 to 10	3 - 5 servings[2]	0 servings
Fruit consumption	0 to 10	2 - 4 servings[2]	0 servings
Milk consumption	0 to 10	2 - 3 servings[2]	0 servings
Meat consumption	0 to 10	2 - 3 servings[2]	0 servings
Total fat intake	0 to 10	30% or less energy from fat	45% or more energy from fat
Saturated fat intake	0 to 10	Less than 10% energy from saturated fat	15% or more energy from saturated fat
Cholesterol intake	0 to 10	300 mg or less	450 mg or more
Sodium intake	0 to 10	2400 mg or less	4800 mg or more
Food variety	0 to 10	8 or more different items in a day	3 or fewer different items in a day

[1]People with consumption or intakes between the maximum and minimum ranges or amounts were assigned scores proportionately.
[2]Number of servings depends on Recommended Energy Allowance—see table 2. All amounts are on a per day basis.

USDA Food Guide Pyramid Food Group Components

The USDA Food Guide Pyramid translates recommendations from the *Dietary Guidelines for Americans (16)* into groups and amounts of foods people can eat to achieve a healthful diet. The recommended number of Food Guide Pyramid servings depends on a person's caloric requirement. In developing the Index, the researchers used serving recommendations from the Food Guide Pyramid for various age/gender groups. Pyramid serving recommendations for 1600, 2200, and 2800 calories were used as the basis to interpolate serving recommendations for age/gender groups not described in the Pyramid (table 2).

A maximum score of 10 was assigned to each of the five food group components of the Index. People whose diets met or exceeded the recommended number of servings for a food group received the maximum score of 10 points. For example, if a person's diet met the fruits group serving recommendations, then that person's diet was awarded 10 points. For each of the five major food groups, a score of zero was assigned to the respective components if a person did not consume any item from the food group. Intermediate scores were computed proportionately to the number of servings consumed. For example, if the serving recommendation for a food group was eight and a person consumed four servings,

the component score was 5 points. Similarly, if six servings were consumed, a score of 7.5 was assigned.

The Recommended Energy Allowance (REA) *(9)* for children 2 to 3 years of age is less than 1600 kilocalories. The recommended number of servings was kept at the minimum serving level for these children, but the serving size was scaled downward to be proportionate with their food energy recommendations. This approach is consistent with Food Guide Pyramid guidance. In contrast, adult males 15 to 50 years old have an REA slightly greater than 2800 kilocalories *(9)*. Because the Food Guide Pyramid does not specify additional food group

Table 2. Recommended number of USDA Food Guide Pyramid servings per day, by age/gender categories

Age/gender category	Energy (kilocalories)	Grains	Vegetables	Fruits	Milk	Meat[1]
Children 2-3[2]	1300	6	3	2	2	2
†	1600	6	3	2	2	2
Children 4-6	1800	7	3.3	2.3	2	2.1
Females 51+	1900	7.4	3.5	2.5	2	2.2
Children 7-10	2000	7.8	3.7	2.7	2	2.3
Females 11-24	2200	9	4	3	3	2.4
†	2200	9	4	3	2	2.4
Females 25-50	2200	9	4	3	2	2.4
Males 51+	2300	9.1	4.2	3.2	2	2.5
Males 11-14	2500	9.9	4.5	3.5	3	2.6
†	2800	11	5	4	2	2.8
Males 19-24	2900	11	5	4	3	2.8
Males 25-50	2900	11	5	4	2	2.8
Males 15-18	3000	11	5	4	3	2.8

[1]One serving of meat equals 2.5 ounces of lean meat.
[2]Portion sizes were reduced to two-thirds of adult servings except for milk for children age 2-3.
† Recommended number of servings per day at food energy levels specified in the Food Guide Pyramid *(15).*

servings for caloric levels above 2800 kilocalories, researchers decided that food portions for these individuals would be truncated at the maximum levels recommended in the Food Guide Pyramid. For more details on determination of Food Guide Pyramid serving definitions, estimation of food group serving requirements by age and gender, and design alternatives, the reader is referred to the administrative report *(3).*

For each of the five major food groups, serving definitions used to compute the food group scores were intended to be as consistent as possible with the concepts and definitions described in the Food Guide Pyramid *(15).* Serving definitions reflect consistency with the underlying rationale in terms of nutrient contributions from each of the five major food groups. These definitions are also consistent with the Pyramid concept of defining servings in common household measures and easily recognizable units. The servings calculated for the HEI were based on the Pyramid Servings database developed by the USDA's Agricultural Research Service.

In calculating the HEI, USDA researchers found it necessary to assign the foods in mixtures, in the appropriate amounts, to their constituent food groups. Pizza, for example, can make significant contributions to several food groups, including grains, vegetables, milk, and meat. The approach used was a straightforward extension of the one used to estimate serving sizes. Commodity compositions of foods were identified. Commodities were then assigned to appropriate food groups based on the gram/serving size factors that were calculated. Dry beans and peas were first assigned to the meat group if the meat serving recommendations were not met, after which they were added to the vegetables group.

Fat and Saturated Fat Components

Index scores for fat and saturated fat intakes were examined in proportion to total food energy expressed as kilocalories. Total fat intake of less than or equal to 30 percent of total calories in a day was assigned a maximum score of 10 points. This percentage is based on the 1995 recommendations of the *Dietary Guidelines for Americans*. Fat intake equal to, or greater than, 45 percent of total calories in a day was assigned a score of zero. Intake of fat between 30 and 45 percent was scored proportionately.

Saturated fat intake of less than 10 percent of total calories in a day was assigned a maximum score of 10 points. This percentage is also based on the 1995 recommendations of the *Dietary Guidelines for Americans.* Saturated fat intake equal to, or greater than, 15 percent of total calories in a day was assigned a score of zero. Intake of saturated fat between 10 and 15 percent was scored proportionately. The upper limit percentages for fat (45 percent) and saturated fat (15 percent) were based on consultation with nutrition researchers and exploration of the consumption distribution of these components.

Cholesterol Component

The score for cholesterol was based on the amount consumed in milligrams. A score of 10 points was assigned when daily cholesterol intake was 300 milligrams or less. This amount is based on recommendations of the Committee on Diet and Health of the National Research Council and represents a consensus of experts in foods and nutrition, medicine, epidemiology, public health, and related fields *(8)*. A score of zero was assigned when daily intake reached a level of 450 milligrams or more. Intake between 300 and 450 milligrams was scored proportionately. The upper limit for cholesterol intake was based on consultation with nutrition researchers and exploration of the consumption distribution of this component.

Sodium Component

The score for sodium was based on the amount consumed in milligrams per day. A score of 10 points was assigned when daily sodium intake was 2400 milligrams or less, the amount based on recommendations of the Committee on Diet and Health of the National Research Council *(8)*. A daily intake of 4800 milligrams or more received zero points. Intake between 2400 and 4800 milligrams was scored proportionately. The upper limit for sodium intake was based on consultation with nutrition researchers and exploration of the consumption distribution of this component.

Variety Component

The *Dietary Guidelines,* the Food Guide Pyramid, and the National Research Council's diet and health report all stress the importance of variety in a diet *(4,8,15)*. There is no consensus, however, on how to quantify variety. Dietary variety was assessed by totaling the number of different foods that a person ate in a day in amounts sufficient to contribute at least one-half of a serving in a food group. Food mixtures were disaggregated into their food ingredients and assigned to the appropriate food category. Foods that differed only by preparation method were grouped together and counted as one type of food. For example, baked, fried, or boiled potatoes were counted once. Different types of a food were considered to be a different food. For example, each type of fish—mackerel, tuna, and trout—was considered to be a different food. A

maximum variety score of 10 points was assigned if a person consumed at least half a serving each of 8 or more different types of foods in a day. A score of zero was assigned if 3 or fewer different foods were consumed by a person in a day. Intermediate scores were computed proportionately. These upper and lower limit amounts to gauge food variety were based on consultation with nutrition researchers. For more details on the coding structure used to compute the variety component of the HEI, the reader is referred to the administrative report *(3)*.

Data and Methods Used to Calculate the Healthy Eating Index

USDA's Continuing Survey of Food Intakes by Individuals (CSFII) provides information on people's consumption of foods and nutrients and extensive information about Americans' demographic and socioeconomic characteristics. CNPP used CSFII data for 1994-96—the most recent data available—to compute the HEI.

For the 1994-96 CSFII *(13),* dietary intakes of individuals were collected on 2 nonconsecutive days. Data were collected through an in-person interview using the 24-hour dietary recall method, with the parent or main meal planner reporting information for individuals under age 12. The survey was designed to be representative of the U.S. population living in households, and lower income households were oversampled to increase the precision level in analyses of this group. Weights were used to make the sample representative of the U.S. population.

Table 3. Healthy Eating Index: Overall and component mean scores, 1994-96

	Year			
	1994	1995	1996	1994-96
Overall	63.6	63.5	63.8	63.6
Components				
Grains	6.6	6.7	6.7	6.7
Vegetables	6.1	6.2	6.3	6.2
Fruits	3.9	3.9	3.8	3.9
Milk	5.4	5.4	5.4	5.4
Meat	6.6	6.5	6.4	6.5
Total fat	6.8	6.8	6.9	6.8
Saturated fat	6.4	6.3	6.4	6.4
Cholesterol	7.9	7.7	7.9	7.8
Sodium	6.3	6.3	6.3	6.3
Variety	7.7	7.6	7.6	7.6

Note: The overall HEI score ranges from 0-100. An HEI score over 80 implies a "good" diet, an HEI score between 51 and 80 implies a diet that "needs improvement," and an HEI score less than 51 implies a "poor" diet. HEI component scores range from 0-10. High component scores indicate intakes close to recommended ranges or amounts; low component scores indicate less compliance with recommended ranges or amounts.

The HEI was computed for people with complete food intake records for the first day of the survey: this allows for comparisons across the years. Prior research has indicated that food intake data based on 1-day dietary provide reliable measures of usual intakes of groups of people *(2)*. The HEI was computed for all individuals 2 years and older—dietary guidelines apply to people of these ages only. Pregnant and lactating women were excluded because of their special dietary needs. Final sample sizes were 5,167 in 1994, 4,904 in 1995, and 4,791 in 1996.

Results

Overall Healthy Eating Index Scores

The mean HEI score is 63.6 for 1994, 63.5 for 1995, and 63.8 for 1996 (table 3). An HEI score over 80 implies a "good" diet; an HEI score between 51 and 80, a diet that "needs improvement;" and an HEI score less than 51, a "poor" diet.[2] Between 1994 and 1996, the diets of most people (70 percent) needed improvement (fig. 2). About 12 percent of the population had a good diet, and 18 percent had a poor diet.

[2]In the initial HEI work, Kennedy et al. *(7)*, in consultation with nutrition experts, developed this scoring system for a "good" diet, a diet that "needs improvement," and a "poor" diet.

Figure 2. Healthy Eating Index Rating, U.S. population, 1994-96

1994	1995	1996

1994: 11.4%, 70.0%, 18.6%
1995: 11.2%, 71.7%, 17.2%
1996: 12.2%, 70.5%, 17.3%

□ Diet classified as "Good" (Healthy Eating Index score greater than 80)
▨ Diet classified as "Needs Improvement" (Healthy Eating Index score between 51 and 80)
■ Diet classified as "Poor" (Healthy Eating Index score less than 51)
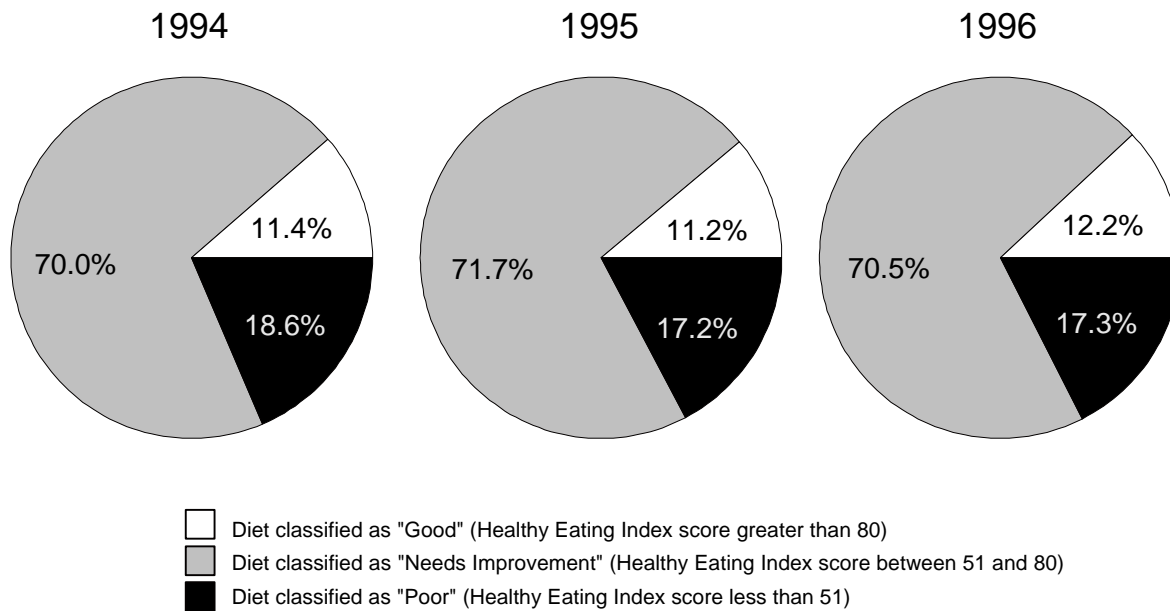
Healthy Eating Index Component Scores

During the 1994-96 period, the highest or best mean HEI component score for the U.S. population was for cholesterol (table 3). The cholesterol score averaged 7.8 on a 10-point scale. With an average score of 7.6, variety accounted for the second highest component score. The fruits and milk components of the HEI had the two lowest mean scores over the period: 3.9 and 5.4, respectively. Average scores for the other HEI components were between 6 and 7.

Overall, 71 percent of people had a maximum score of 10 for cholesterol—that is, they met the dietary recommendation (table 4). Fifty-two percent had a maximum score for variety over the 3 years. Fewer than 50 percent of the population met the dietary recommendations for the other 8 HEI components

during 1994-96. About 17 percent of people consumed the recommended number of servings of fruit each day. Twenty-two to 31 percent of people met the dietary recommendations for the grain, vegetables, milk, and meat components of the HEI, and 35 to 40 percent met the dietary recommendations for total fat, saturated fat, and sodium. In general, most people could improve all aspects of their diets.

Healthy Eating Index Scores by Population Characteristics

HEI scores varied by Americans' demographic and socioeconomic characteristics (table 5). Females had slightly higher scores than did males. Children ages 2 to 3 had the highest average HEI score (74 for 1994-96) among all children, as well as among all age/gender groups. Older children had lower HEI scores than did younger children. Children

ages 2 to 3 scored particularly higher on the fruits and milk components of the HEI than did older children. For example, the average fruit score for children ages 2 to 3 was 7 for 1994-96, compared with 3.5 for males ages 11 to 14; the average milk score for children ages 2 to 3 was 7.3, compared with 5.2 for females ages 11 to 14 (data not shown in tables). Most age/gender groups had HEI scores in the 60- to 69-point range. Both females and males age 51 and over had higher HEI scores than did other adults.

Asian and Pacific Islander Americans had the highest HEI score among the racial groups—an average of 67 for 1994-96. Asian and Pacific Islander Americans had higher average scores on the grain and fat components of the HEI than was the case for other racial groups. (Data are not shown in the tables.)

Table 4. Percent of people meeting the dietary recommendations for Healthy Eating Index components

Components	Year			
	1994	1995	1996	1994-96
Grains	21.9	23.0	22.2	22.4
Vegetables	29.4	30.8	31.8	30.7
Fruits	17.8	17.4	17.1	17.4
Milk	25.4	25.4	25.5	25.4
Meat	29.8	29.1	26.4	28.4
Total fat	36.8	36.5	37.5	36.9
Saturated fat	40.3	39.1	40.1	39.8
Cholesterol	71.2	68.8	71.9	70.6
Sodium	35.4	34.5	34.7	34.9
Variety	52.2	52.0	53.0	52.4

Note: For each component, a person received a maximum score of 10 for meeting the dietary recommendations.

African Americans scored particularly lower on the milk and fat components of the HEI....

Whites had a higher average HEI score than African Americans had for 1994-96 (64 vs. 59). African Americans scored particularly lower on the milk and fat components of the HEI—an average of 4.2 and 6.2, respectively. Whites scored an average of 5.7 and 6.8 on these two components, respectively. (Data are not shown in the tables.) There was almost no difference in diet quality between Hispanics and those not Hispanic.

HEI scores increased modestly with income. People with household income at or below 50 percent of the poverty thresholds had an average HEI score of 60 for 1994-96, and those with household income between 51 and 100 percent of the poverty thresholds had an average HEI score of 61.[3] People with a household income over three times the poverty thresholds scored higher on the HEI: 65. People in higher income households scored better on the saturated fat and sodium components of the HEI than did people in lower income households. People with household income over three times the poverty threshold had an average score of 6.6 for saturated fat and 7.9 for sodium; those with household income 50 percent or below the poverty threshold had an average score of 5.7 for saturated fat and 6.6 for sodium. (Data are not shown in the tables.)

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[3]In 1995, the poverty thresholds were $9,935 for a family of two, $12,156 for a family of three, $15,570 for a family of four, and $18,407 for a family of five.

Table 5. Healthy Eating Index, overall mean scores by selected characteristics, 1994-96

Characteristic	Index score			
	1994	1995	1996	1994-96
Gender				
Male	63.0	63.0	62.6	62.9
Female	64.2	64.0	65.0	64.4
Age/gender				
Children 2-3	74.4	74.0	73.2	73.9
Children 4-6	66.4	68.8	68.0	67.7
Children 7-10	66.9	67.1	65.9	66.6
Females 11-14	63.1	63.5	64.0	63.5
Females 15-18	61.4	58.4	62.5	60.8
Females 19-50	61.8	61.2	62.7	61.9
Females 51+	67.1	67.6	67.5	67.4
Males 11-14	62.4	63.2	61.2	62.3
Males 15-18	60.4	61.4	60.2	60.7
Males 19-50	61.2	60.6	60.6	60.8
Males 51+	64.0	64.0	65.2	64.4
Race				
White	64.2	63.9	64.4	64.2
African American	58.9	59.5	59.4	59.3
Asian/Pacific Islander American	65.8	66.7	68.0	66.8
Other[1]	64.8	64.5	64.0	64.4
Ethnicity				
Hispanic	63.8	64.5	63.2	63.8
Not Hispanic	63.6	63.4	63.9	63.6
Income as % of poverty				
0-50	58.8	61.2	60.7	60.2
51-100	60.5	61.4	60.5	60.8
101-130	61.5	61.6	61.6	61.6
131-200	62.8	61.4	63.7	62.6
201-299	63.8	63.6	63.6	63.7
300 plus	65.0	64.9	65.0	65.0
Education				
4 years high school or less	60.8	60.6	61.0	60.8
Some college	63.5	63.0	63.2	63.2
4 years college	66.6	65.4	67.1	66.4
More than 4 years college	67.6	68.1	68.4	68.0
Region				
Northeast	65.3	65.0	65.8	65.4
Midwest	64.1	64.0	65.2	64.4
South	61.7	61.7	61.3	61.6
West	64.5	64.6	64.7	64.6
Urbanization				
MSA,[2] central city	64.0	63.2	64.3	63.8
MSA, outside central city	64.5	64.6	64.7	64.6
Non-MSA	61.0	61.6	61.6	61.4

[1]Includes American Indians and Alaskan Natives.
[2]Metropolitan Statistical Area.
Note: The overall HEI score ranges from 0-100. An HEI score over 80 implies a "good" diet, an HEI score between 51 and 80 implies a diet that "needs improvement," and an HEI score less than 51 implies a "poor" diet.

Education level was positively associated with a better diet. People with a high school diploma or less had an average HEI score of 61 for 1994-96, 5 to 7 points less than the scores for those with 4 years of college (66) and those with more than 4 years of college (68). Education may be a predictor of people's ability to translate nutrition guidance information into better dietary practices. Higher education is also associated with higher earnings.

There were regional differences in diet quality. People in the Northeast had the highest HEI score, an average of 65 for 1994-96, and those in the South had the lowest score, an average of 62. People in the South scored lower on the total fat component of the HEI than did people in other regions (data not shown in the tables). People who lived in an urban area (a Metropolitan Statistical Area in or outside a central city) also had a slightly higher HEI score than did people who lived in a nonurban area. This could be because average income, which is an indicator of one's ability to purchase food, is lower in nonurban than in urban areas.

Based on the demographic and socio-economic characteristics examined, no subgroup of the population had an average HEI score greater than 80—a score that implies a good diet. Certain segments of the American population have a poorer quality diet, compared with other groups. This underscores the need to tailor nutrition policies and programs to meet the needs of different segments of the population, particularly those at a higher risk of having a poor diet.

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Table 6. Mean Body Mass Index by Healthy Eating Index rating for adults, 1994-96

Age/gender group	Diet quality		
	Good	Needs improvement	Poor
1994			
Females 19+	25.1	25.6	26.0
Males 19+	25.4	26.4	26.6
1995			
Females 19+	25.3	25.6	26.3
Males 19+	25.6	26.5	26.5
1996			
Females 19+	24.8	25.7	26.4
Males 19+	25.7	26.4	26.8
1994-96			
Females 19+	25.1	25.6	26.2
Males 19+	25.6	26.4	26.6

Note: The overall HEI score ranges from 0-100. An HEI score over 80 implies a "good" diet, an HEI score between 51 and 80 implies a diet that "needs improvement," and an HEI score less than 51 implies a "poor" diet.

Healthy Eating Index and Body Mass Index

Obesity is a significant health problem in the United States. Physical measures of appropriate body weight, such as the Body Mass Index (BMI),[4] are influenced by eating patterns and physical activity. For adults, a BMI of 25 is defined as the upper boundary of healthy weight for both men and women *(4)*.

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[4]BMI = weight (in kilograms)/height (in meters)^2. For the CSFII, mean BMI values are based on self-reported height and weight.

Both females and males age 19 and over with a better diet had a lower BMI (table 6). This finding implies a connection between people's diet quality and their BMI. People with a poor diet are more likely to have a higher BMI, while people with a good diet are more likely to have a lower BMI. Although people with a diet rated as good had a lower BMI than others had, the BMI for many of these people was slightly over 25. This is because, in addition to eating patterns, other factors such as physical activity influence BMI.

Trends in the Healthy Eating Index: 1989 vs. 1996

How has the quality of the American diet changed from 1989 to 1996 (the first and latest years the Index was calculated) (table 7)? This comparison examines overall HEI scores and Index component scores based on 1-day intake data. The 1989 HEI results are from the previous HEI report *(14)*.

The diets of Americans have slightly, but significantly, improved since 1989. However, people's diets still need to improve further. In 1989, the HEI score for all people was 61.5.[5] By 1996 it was 63.8—a 4-percent increase.[6] Scores increased for all HEI components from 1989 to 1996, with the exception of milk, meat, and sodium. The decrease in the sodium score may be related to the increase in the grain score; grain products contribute large amounts of dietary sodium *(11)*. Noticeable gains in HEI component scores were made in saturated fat and variety.

The increase in the HEI since 1989 may be due to several factors. Since then the Federal Government began various nutrition initiatives—the Food Guide Pyramid, revised Dietary Guidelines for Americans, and the Nutrition Labeling and Education Act. These initiatives were aimed at improving the eating habits of Americans. Also, since 1989, many people have become more aware of the health benefits of a better diet through various nutrition campaigns.

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[5]Based on 1-day intake data *(14)*.

[6]Because methods changed from 1989 to 1996 in food group serving calculations, food group scores in 1994-96 may be smaller than they would be using 1989 methods. Hence, the improvement in people's diets between 1989 and 1996 is likely greater than reported here.

Table 7. Healthy Eating Index, overall and component mean scores, 1989 versus 1996

	1989	1996
Overall	61.5	63.8
Components		
Grains	6.1	6.7
Vegetables	5.9	6.3
Fruits	3.7	3.8
Milk	6.2	5.4
Meat	7.1	6.4
Total fat	6.3	6.9
Saturated fat	5.4	6.4
Cholesterol	7.5	7.9
Sodium	6.7	6.3
Variety	6.6	7.6

Note: The overall HEI score ranges from 0-100. An HEI score over 80 implies a "good" diet, an HEI score between 51 and 80 implies a diet that "needs improvement," and an HEI score less than 51 implies a "poor" diet. HEI component scores range from 0-10. High component scores indicate intakes close to recommended ranges or amounts; low component scores indicate less compliance with recommended ranges or amounts. For 1989, scores are based on 1-day intake data.

Conclusions

Americans' eating patterns, as measured by the Healthy Eating Index (HEI), have slightly, but significantly improved since 1989. Although this trend is in the desired direction, the diets of most Americans still need improvement. In 1994-96, only 12 percent of Americans had a diet that could be considered good.

From 1989 to 1996, the average scores increased for 7 of the 10 HEI components: Grains, vegetables, fruits, total fat, saturated fat, cholesterol, and variety. Grains, vegetables, and fruits are generally high in fiber and low in total fat, saturated fat, and cholesterol, thereby influencing these latter three components. Although fruit scores increased, in 1996 only 17 percent of all Americans ate the recommended number of fruit servings on a given day.

From 1989 to 1996, the average score for the milk, meat, and sodium components declined. In 1996, only 26 percent of people consumed the recommended number of servings of milk products on a given day. Before then, there had been a decline in milk consumption and a simultaneous increase in carbonated soft drink consumption *(10)*. The decrease in the sodium score is likely related to the increase in the grains score because many grain products, such as breads, are high in sodium.

One of the factors that influence dietary quality is income. The impact of income on the ability to purchase a variety of

foods is evident in the variety scores for different income groups. People with a higher income are able to afford more variety—more types of fruits and vegetables—in their diets, and their HEI scores tend to increase. People with a household income 50 percent of the poverty thresholds or below had an average variety score of 6.9 for 1994-96; whereas, those with a household income of 300 percent of the poverty thresholds or more had an average variety score of 7.9 (data not shown in the tables).

Education, age, gender, race, and area of residence also influence diet quality. People with 4 years of college have a better diet than those without. People with more education may acquire more nutrition information, which improves the quality of their diets *(18)*. In general, children less than 11 years of age have a better diet than others: perhaps parents are more attentive to children's diets. Adults over 50 years of age have better diets than other adults have, and females tend to have a slightly more healthful diet than males do. African Americans and people living in the South and nonurban areas have a poorer quality diet than do their respective counterparts.

These findings provide an awareness and better understanding of the types of dietary changes needed to improve people's eating patterns. USDA and other Federal Departments conduct various nutrition education and promotion activities designed to improve people's diets. USDA also has a number of partnerships with the private sector to achieve this goal. The HEI is an important tool that can be used to assess the effect of these activities and to provide guidance to better target and design nutrition education and public health interventions.

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The Influence of Commercialism on the Food Purchasing Behavior of Children and Teenage Youth

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The nutritional well-being of children is a high priority, given our knowledge relating nutrition to health risks in this group and the importance of early childhood experiences in forming lifetime behavioral patterns. Children are becoming consumers at younger ages, and a variety of influences and experiences shapes their consumer habits. This paper reviews the marketing literature to gain insight into the purchasing power, habits, and purchase influence of children and teenage youth and also to examine the influence of commercialism on their food purchasing behavior. The findings are discussed within the context of building young consumers' information-processing skills in order to help them make informed dietary choices in the marketplace.

S triving to achieve optimal nutritional well-being among children is a high priority, given our knowledge relating nutrition to disease risks and the importance of early childhood experiences in forming lifetime behavioral patterns. The eating patterns of children and teenagers have changed significantly over the past two decades. Children and teenage youth are eating more frequently, getting a greater proportion of their nutrient intake from snacks, eating more meals away from home, and consuming more fast food *(4,16)*. Nationwide surveys show that food consumption patterns of most American children do not meet the Dietary Guidelines. The average diet of American children exceeds the recommendations for fat, saturated fat, and sodium, and childhood obesity is a growing problem across all income strata *(16)*. Thus, it appears unlikely that the goals for children's diets for fat and saturated fat set forth in the Healthy People Objectives 2000 will be reached by the year 2000 *(16)*.

Children are becoming consumers at younger and younger ages, and a variety of influences and experiences shapes their consumer habits. Of particular interest and concern are factors that affect their food- and nutrition-related

decisions and behavior. Many factors interplay to affect children's and teenage youths' consumer decisionmaking skills and behavior that can directly influence their dietary choices and eating patterns. The family has been identified as one of the most influential environmental factors affecting food- and nutrition-related decisions and behavior, operating at the levels of parent modeling and parent-child interactions *(7)*.

Recent changes in American family structure, intrafamilial decisionmaking, and women's work patterns have had a profound influence on the growing economic power, control, and independence of children and teenage youth, with the result that they now exert a stronger influence on family decision-making than their cohorts did in previous years *(21)*. Other factors that may potentially affect children's and teenage youths' consumer habits are peer influence, ethnicity and culture, the school environment, and commercialism *(4,21,25)*.

Commercialism is broadly defined as the vehicle of communication that creates consumer awareness and induces the desire for specific products; its goal is to increase consumer demand and commercial profit *(25)*. Commercial pressures on children and teenage youth may encourage continual consumption and acquisition at the expense of informed consumer decisionmaking and environmental sensitivity *(2)*. Children with poorly developed consumer decision-making skills are unprepared to make wise purchases as adults, a situation that has serious implications for the consumer habits and nutritional health of future generations.

The purpose of this paper is to review the general purchasing power, purchase influence, and habits of children, ages 4-11, and teenage youth, ages 12-19. The review is followed by an examination of the influence of commercialism on food purchasing behavior. In particular, this paper reviews the findings and trends from the marketing literature, rather than from the nutrition education literature, in order to share the marketing perspective with nutrition professionals. Specifically, it aims to integrate what has been learned from consumer behavior research into nutrition education interventions so that young consumers can make informed choices and purchases in the marketplace. The findings are discussed within the broader context of consumer socialization.

Purchasing Power, Purchase Influence, and Habits

Descriptive data from marketing surveys provide useful information about children's and teenage youths' amount and sources of income, as well as their saving and spending habits. Data from the 1987-88 National Survey of Families and Households indicate that about 47 percent of teenagers ages 12-18 living in two-parent families receive an allowance, and an estimated 62 percent report earned income *(9)*. According to the 1990 Consumer Expenditure Survey, teenage youth, ages 14-19, employed outside the home had mean annual earnings of $2,611 in two-earner, two-parent families, compared with $2,704 in one-earner, two-parent families. These results suggest that the direct monetary contribution of teenage youths' employment on middle-class family income and expenditures appears to be minimal *(9),* compared with their influence on family purchases.

In 1989, the income of 4- to 12-year-olds averaged $4.42 each week or about $230 each year *(22)*. Between 1989 and 1991, the income of this age group increased 82 percent despite an economic recession. This is a significant figure to marketers, because the majority of children can use most of their money for discretionary purposes *(22)*. Children receive more than 80 percent of their income from the family and the remainder from other sources such as outside jobs. Income sources include gifts from parents, relatives, and friends; household chores; and work done outside the home *(20)*. The purchasing power of children and teenage youth increases significantly beyond what they earn or receive as gifts when their ''purchase influence''[1] is considered *(27)*.

Each year the purchase influence of children increases with age: $15 billion for 3- to 5-year-olds, $45 billion for 6- to 8-year-olds, $65 billion for 9- to 11-year-olds, $80 billion for 12- to 14-year-olds, and $90 billion for 15- to 17-year-olds (table 1) *(27)*. Teenage youth are spending more of the family dollar as they take on increasing responsibilities in the home. They are exerting more independence than in the past because a growing number of them have a car, a job, dual-earner parents, and access to family credit cards. The total amount of family income teenagers spend increases as they get older *(12)*.

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[1]*Purchase influence* is a term used by marketers and is defined as a child's or teenager's influence on family purchases. Children's items include toys and clothes; housing items, televisions and stereo equipment; and family items, vacations and food.

Table 1. The spending power of children and teenage youth

			Ages		
	3-5	6-8	9-11	12-14	15-17
Spending					
$/week/person	$2.40	$3.80	$4.80	$22.00	$43.00
$ billion/year	$1.50	$2.20	$2.80	$12.00	$23.00
Purchase influence of segment					
$ billion	$15.00	$45.00	$65.00	$80.00	$90.00

Source: Stipp, H., 1993, New ways to reach children, American Demographics 15:50-56.

Children make independent shopping trips, and their saving and spending habits differ by gender. Nearly 75 percent of 7- to 9-year-olds make an average of two independent trips to the store each week. A 10-year-old averages 5 visits each week to 5 different stores, representing 250 store visits each year *(20)*.

Children save an average of 40 percent of their income. Girls and boys ages 4-12 have significantly different saving and spending habits *(22)*. Although girls have a lower income and expenditures than boys have, girls are in stores more often. Girls receive lower weekly incomes than boys receive ($7.66 versus $8.87); the greatest difference is attributed to a lower weekly allowance. However, girls save about 25 percent more than boys save. Compared with boys, girls go to stores by themselves less frequently, a weekly average of .84 times, compared with 1.11 times for boys. On a weekly basis, girls, however, visit stores more often with their parents, averaging 2.65 visits, compared with 2.34 visits for boys.

Food Purchasing Behavior

Because the current generation of young consumers is making more decisions than previous generations of children and teenage youth, they are influencing more family decisions concerning food *(30)*. Findings from the 1989 USA Weekend/Roper Report on Consumer Decision-Making in American Families suggest that 78 percent of children and teenage youth influence where the family goes for fast food; 55 percent, the choice of restaurant for dinner; 50 percent, the type of food the family eats at home; and 31 percent, the specific product brands that families purchase. Parents are two to three times more likely to name a child—not themselves—as the family expert for selection of fast food, snack food, restaurants, and new breakfast cereals *(30)*.

Another survey confirms these findings. It indicates that nearly 50 percent of parents believe that meal and grocery choices and restaurant selection are influenced by their children *(3)*. When

Parents are two to three times more likely to name a child—not themselves—as the family expert for selection of fast food, snack food, restaurants, and new breakfast cereals.

asked to describe the barriers that interfere with their family changing to a healthful diet, parents identified two: varying food preferences of family members and children's desire to eat advertised foods *(3)*.

Almost half of family food expenditures (46 percent) are for food and beverages served outside the home, with 34 percent of the total food dollar spent on fast foods *(4)*. When families eat at home and their food has been prepared elsewhere, they support a $45.5 billion restaurant take-out market *(4)*. Marketers have identified several characteristics children look for in their favorite restaurants: Best food, best toys and prizes, best meal packs, the most fun, best playgrounds, and the opportunity to accompany friends with their parents *(11)*.

McNeal investigated the total sales, percent of sales influenced by children, and the volume of child-influenced sales in billions of 1990 dollars *(21)*. These findings suggest that on average, children influence 17 percent of family spending in 62 product categories totaling $132 billion. At least one-third of the industry sales of fast foods, candy and gum, packaged cookies, hot cereals, juices and juice drinks, peanut butter, frozen pizza, and toaster products are influenced by children (table 2) *(21)*.

Television commercials and prime-time programs have been identified as important influences on the types of food that children ask their parents to buy for them and the food they buy for themselves. Sweetened breakfast cereals, candy, desserts, low-nutrient beverages, and salty snack foods are the most commonly advertised products to children and are also the items most frequently requested of parents *(6,14,17,28,29)*.

Table 2. Selected food-related product categories, percent of sales influenced by children, and volume of child-influenced sales ($ billions of 1990 dollars)

Category	Total industry sales ($ billions)	Percent of sales influenced by children	Volume of child-influenced sales ($ billions)
Bakery goods	$26.10	10%	$2.61
Candy and gum	10.43	33	3.44
Cereals (cold)	6.90	20	1.38
Cereals (hot)	0.74	50	.037
Cookies (packaged)	4.30	40	1.72
Dairy goods	40.20	10	4.02
Fast foods	65.00	35	22.75
Fruits and vegetables			
Canned	3.00	20	0.60
Fresh	43.40	6	2.60
Ice cream	7.60	23	1.75
Juices and juice drinks	10.00	33	3.30
Meats			
Packaged	17.10	13	2.20
Fresh	43.10	10	4.30
Microwave meals	2.30	30	.069
Peanut butter	1.40	40	.056
Pizza (frozen)	0.92	40	0.37
Salty snacks	8.30	25	2.08
Soda	46.60	30	13.98
Toaster products	0.25	45	0.11
Yogurt	1.20	10	0.12
Total	$338.84*	-	$67.49**

*This figure represents 44.1 percent of total sales in 19 of 62 product categories.
**This figure represents 50.8 percent of the total volume of child-influenced sales in 19 of 62 product categories.
Source: McNeal, J.U., 1992, The littlest shoppers, American Demographics 14(2):48-53.

Isler et al. explored the nature and frequency of products and services that children ages 3-11 requested of their mothers during a 28-day period, how and where they made purchase requests, and mothers' perceptions of the key reasons for children's specific requests *(14)*. Results suggest the following:

- Preschool children make significantly more requests than made by older, elementary school-age children.

- Food accounts for over half (54.5 percent) of total requests made by children, representing snack foods (23.9 percent), candy (16.8 percent), cereal (6.8 percent), fast foods (3.6 percent), and fruit and vegetables (3.4 percent).

- Children's desire for cereal and snack foods remains constant across all age categories.

- Children request more presweetened cereals than other types, accounting for nearly two-thirds (64.9 percent) of all cereal requests.

- Sugared dessert products account for most snack items requested, followed by beverages and salty snacks such as chips and pretzels.

- Most of the older children's requests are made at home; whereas, younger children tend to make requests while shopping with their mothers.

- Mothers indicate that seeing the product in the store is the primary reason younger children request candy, but the mothers believe that several influences besides television advertising account for older children's purchase requests *(14)*.

In 8 of 10 cases, the supermarket is the first store that children visit. This is where more than 75 percent of children make their first purchase request;

56 percent, their first self-selection; and 20 percent, their first assisted purchase. A discount store is the most likely site of a child's first independent purchase, where 43 percent of children buy their first item unassisted. Almost half (47 percent) of children's in-store requests are for ready-to-eat cereals, and 30 percent of first product requests are for snack items such as candy, cookies, and frozen desserts. Marketers believe that parents often give these items to their children as rewards. Hence marketers reinforce this practice through targeted advertising *(23)*.

To increase their share of the future adult market, product manufacturers and advertisers share the common objective of building brand loyalty among children and teenage youth *(12)*. Market research reveals that children and teenage youth identify products more frequently by brand name rather than food category *(1,10)*. Product usage information also indicates that children have significant influence over what brands are bought for them. One study revealed that 65 percent of mothers shopping for food and beverages divided their purchases equally between store brands and national brands. When a child influenced a purchase, the child requested a national brand by name 80 percent of the time and a product by category only 20 percent of the time *(1)*.

Differences in age and cognitive development appear to affect the purchasing behavior of young consumers in the marketplace. When a group of 4- to 10-year-old children were asked to classify cereal and beverage products based on either perceptual attributes (e.g., product shape, color, or package size) or underlying attributes (e.g., flavor, sweetness, and nutritional content), younger children used perceptual attributes to group

products; whereas, older children relied more on underlying attributes. Extending these findings to a marketing context, advertisers might expect younger children to use perceptual cues and older children to use underlying cues to classify brands. Marketers commonly use both types of attributes to market products to children and teenagers because there are few real differences between brand products *(15)*.

Among 16- to 17-year-olds, girls spend more of the family income than boys do because girls shop for groceries more frequently. Over half of the 29 million 12- to 19-year-old girls in the United States shop for part or all of the families' groceries each week. Teenage boys are less likely than teenage girls to shop for groceries. More than two-thirds of teenagers have working mothers, and half of their mothers work full-time *(12)*.

A geodemographic cluster analysis suggests a strong relationship between working mothers and teenage grocery shopping *(12)*. Upper and lower income urban households, as well as lower income households in small towns, are above average in the proportion of mothers of teenagers employed full-time. These clusters also have the highest percentage of teenagers who do the grocery shopping for the family, each month spending, on average, $100 of the family budget. Nearly 85 percent of teenagers who do the family grocery shopping say they shop at a large supermarket where a full range of brand products is available. Fifteen percent shop at convenience stores or small family-owned stores. Because a majority of teens are making food-related brand choices for their families, advertisers are using teen-targeted media to build or reinforce brand loyalty during the teenage years *(12)*.

> **Market research reveals that children and teenage youth identify products more frequently by brand name rather than food category.**

Implications

Given the widespread influence of commercialism on the purchasing power, purchase influence, and habits of children and teenage youth, researchers believe that building children's and teenage youths' consumer information processing skills is essential if they are expected to make informed choices and purchases in the marketplace *(31)*. A knowledge of consumer information-processing skills is useful to understand the process that children and teenage youth use to make consumer decisions. By taking a broad approach to improve children's and teenagers' overall ability to act as informed consumers in the marketplace, nutritionists can work collaboratively with potential allies and stakeholders who are also interested in building or strengthening relevant skills. The desirable result is to influence positively children's and teenagers' overall consumer behavior, including their food- and nutrition-related behavior.

Most children will master the basic consumer skills they will use all of their lives before they start school *(23)*. Prior to formal schooling, children have already acquired consumption experiences, attitudes, and motives for their purchases. Using their own and other's experiences, children learn the value of money, what money can buy, how to shop, and what to choose *(23)*.

McNeal proposes a five-stage process that children go through as they become consumers: Observing, making requests, making selections, making assisted purchases, and making independent purchases *(23)*. Several factors shape children's consumer habits at different ages, and their consumer behavior can be described by age and developmental patterns *(24)*. Elementary school-age children are in a stage of mastering consumer literacy skills. Older children move from perceiving information to inferring what the information means and move to progressively learning the consumer decisionmaking sequence that provides the basis for their marketplace interactions as they become adults *(24)*.

Consumer socialization refers to the continual process by which children acquire knowledge and skills and develop attitudes relevant to their present and future behavior as consumers. Consumer socialization is best understood in the context of children developing abilities to select, evaluate, and use information relevant to purchasing. These abilities are also referred to as consumer information-processing skills, examples of which are understanding the purpose of television commercials, differentiating between product brands and attributes, and demonstrating how to spend and save discretionary income effectively *(31)*.

The stages of the information processing model are exposure, attention, comprehension, retention and retrieval, and decisionmaking *(5)*. The information-processing sequence that a consumer typically goes through consists of environmental influences, initial processing, central processing, and outcome (see figure). The two major environmental influences on a child's purchase decision that are identified in this example are the family and television; many others exist. Initial and central processing describes the different cognitive abilities that children use to acquire information (e.g., searching for it, listening to it, selecting what to use, structuring it, interpreting it, and using it). The purchase decision refers to the outcome of a child's decision. A decision to make a purchase requires the child to design a strategy to obtain what is desired *(31)*.

An information-processing model of a specific purchase decision

Environment	Initial Processing	Central Processing	Outcome
family	information search	interpretation & comprehension	purchase decision
television	attention →	structuring information	
	information selection	evaluation	
		use of information	

Source: Ward et al., 1977, How Children Learn to Buy: The Development of Consumer Information-Processing Skills, Sage Publications, Beverly Hills, CA.

Understanding how consumers process information can assist in designing education strategies that will help consumers' food decisionmaking *(5)*. Because children are active participants in the consumer socialization process, it is important to know why they listen to some messages and not others and how environmental factors influence how they process information. Consumer socialization research has helped to identify children's abilities to process the information they receive from the marketplace and has helped to identify gaps in their knowledge and skills that can be addressed within a variety of environmental settings, including home and school *(31)*.

For instance, children and teenagers who shop for themselves and for others require different types of shopping skills. Some skills can be learned by observing and imitating the behavior of others, but most require underlying cognitive skills in order to understand goal-oriented shopping. Some of these skills develop naturally in children; whereas, other skills must be taught. According to the marketing literature, children and teenagers require a range of cognitive skills to be "effective" shoppers, such as classification (e.g., the ability to read and express oneself); arithmetic (e.g., the ability to read numerals, to know ordinal values, to divide, and to count money); and social cognition (e.g., the ability to identify the sales representative and cashier) *(26)*. Nonmarketers, however, may value different types of skills for children and youth to be "effective" shoppers, such as being able to evaluate information critically, to make the wisest purchase among many options, and to buy based on need instead of fashion or product promotion.

A difference exists between what a child ought to be able to do based on his/her level of cognitive development or age and the skills that a child actually applies within a specific context. In one instance, even though fourth graders knew how to use division to calculate unit prices, the majority did not apply this skill in a consumer context. Neither are adult consumers always aware of, or use, unit prices when making purchase decisions *(26)*.

Building Young Consumers' Information-Processing Skills

The recent literature in consumer behavior and nutrition education notes the importance of teaching children consumer skills *(5,18,26)*. Parents who teach consumer skills to their children can increase young consumers' appreciation for the challenges families face. Shopping trips are an opportunity for parents to teach their children valuable consumer skills *(5)*. Parents can help children learn consumer skills by having them make a list of items that fit within a budget; visiting stores with familiar layouts; selecting items from short shopping lists; allowing them to spend small amounts of money; helping them make comparisons on the basis of values other than unit price; and purchasing the food that the family needs for one or several days following the guideline that each day's meal should be nutritionally balanced and fit within the family's food budget *(26)*. The benefits of these recommendations will depend, of course, upon the quality of a parent's nutrition knowledge and consumer skills.

Parents appear to be especially interested in promoting good nutrition habits for their children *(4,7)*. However, parents need knowledge, tools, incentives, and environmental support to provide healthful food choices and to help teach sound eating practices to their children *(4)*. Nutrition educators and other information multipliers can encourage parents to participate in convenient and intensive education efforts involving ''hands on'' activities that they can share with their children at home and in school *(3)*. Parents can also take on greater responsibility to discuss with their children the purpose of advertising, how to analyze commercial messages, how to apply consumer information-processing skills in the marketplace, and even limiting television viewing as needed *(13)*.

School-based interventions designed to improve young consumers' information-processing skills can be made at multiple levels. Consumer education may begin at school in the early grades when children's learning and behavior pertaining to food- and nutrition-related decisions can be influenced.

According to the recommendations presented at the National Action Conference on Healthy Eating for Children, schools; school districts; and local, State, and Federal governments must commit resources to comprehensive, school-based nutrition education programming where healthful eating practices are integrated into other core school subjects. Hence behavioral skills can be established among elementary school-age children and built upon with more abstract problem-solving skills for older children and teenagers *(18)*.

School teachers need comprehensive knowledge of the content of nutrition and fitness education and curricula for integrating nutrition and fitness into broader concepts such as wellness *(18)*. School curricula also need to encourage media literacy to help students become critical viewers of television, movies, and advertising *(2)*. Multiple instructional techniques (e.g., experiential and interactive learning and group problem solving) can be used to convey consumer information-processing skills and healthful eating principles and practices to children and teenagers *(2,13,26)*.

Curricula have been developed to assist children at specific grade levels to understand, assess, and evaluate the intent and sources of advertisements, with special emphasis on improving food purchases in the marketplace *(19)*. Nevertheless, comprehensive evaluations of these curricula are needed to determine effectiveness, and multiple, complementary approaches will be required to raise children's awareness and build consumer information-processing skills, given the growing and lasting presence of commercialism in the lives of young consumers. Nutrition research conducted with adult consumers indicates that this group wants nutrition information, but it is often unutilized because it is difficult to use, not readily available, or not perceived as being useful or new *(8)*.

Summary

A variety of sociocultural, economic, and demographic factors has had a significant influence on the growing economic power, control, and independence exerted by children and teenage youth and also influences their dietary choices and eating patterns. Given the pervasive influence of commercialism in the lives of young consumers and their increasing purchasing power, purchase influence, and habits, special efforts are required to help them make informed choices and purchases in the marketplace. Consumer information-processing theory can be a helpful framework for future research and practice. Building children's and teenage youths' consumer information-processing skills is one strategy, when combined with parental guidance and environmental support (including government and industry partnerships), that can help young consumers make healthful dietary choices before undesirable dietary behaviors have developed.

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Expenditures on Children by Families, 1997

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Since 1960, the U.S. Department of Agriculture has provided estimates of expenditures on children from birth through age 17. This article presents the most recent estimates for husband-wife and single-parent families. Data are from the 1990-92 Consumer Expenditure Survey (CE). The Consumer Price Index is used to update income and expenditures to 1997 dollars. Data and methods used in calculating child-rearing expenses are described. Estimates are provided for major components of the budget by age of child, family income, and region of residence. Expenses on the younger child in a two-child, husband-wife household for the overall United States averaged $5,820 to $13,260 in 1997, depending on the child's age and family income group. Adjustment factors for number of children in the household are also provided. Results of this study can be used in developing State child support guidelines and foster care payments and in developing family educational programs.

S ince 1960, the U.S. Department of Agriculture (USDA) has provided estimates of expenditures on children from birth through age 17. These estimates are used in setting child support guidelines and foster care payments and in developing educational programs on parenthood. This study presents the latest child-rearing expense estimates, which are based on 1990-92 expenditure data updated to 1997 dollars. The study presents these new estimates for husband-wife and single-parent families. It briefly describes the data and methods used in calculating child-rearing expenses[1] and then discusses the estimated expenses.

The estimates are provided for the overall United States. To adjust partially for price differentials and varying patterns of expenditures, the child-rearing expense estimates for husband-wife families are also provided for urban areas in four regions (Northeast, South, Midwest, and West) and rural areas throughout the United States.[2] For single-parent families, estimates are provided only for the overall United States because of sample size limitations. Expenditures on children are estimated for the major budgetary components: Housing, food, transportation, clothing, health care, child care and education, and miscellaneous goods and services. The box describes each expenditure component.

[1]The report "Expenditures on Children by Families: 1997 Annual Report" provides a more detailed description of the data and methods. To obtain a copy, contact USDA, Center for Nutrition Policy and Promotion, 1120 20th Street NW, Suite 200 North Lobby, Washington, DC 20036 (telephone: 202-418-2312).

[2]Urban areas are defined as Metropolitan Statistical Areas (MSA's) and other places of 2,500 or more people outside and MSA; rural areas are places of less than 2,500 people outside an MSA.

Categories of Household Expenditures

Housing expenses consists of shelter (mortgage interest, property taxes, or rent; maintenance and repairs; and insurance), utilities (gas, electricity, fuel, telephone, and water), and house furnishings and equipment (furniture, floor coverings, major appliances, and small appliances). For homeowners, housing expenses do not include mortgage principal payments; in the Consumer Expenditure Survey, such payments are considered to be part of savings. So, total dollars allocated to housing by homeowners are underestimated in this report.

Food expenses consists of food and nonalcoholic beverages purchased at grocery, convenience, and specialty stores, including purchases with food stamps; dining at restaurants; and household expenditures on school meals.

Transportation expenses consists of the net outlay on purchase of new and used vehicles, vehicle finance charges, gasoline and motor oil, maintenance and repairs, insurance, and public transportation.

Clothing expenses consists of children's apparel such as diapers, shirts, pants, dresses, and suits; footwear; and clothing services such as dry cleaning, alterations and repair, and storage.

Health care expenses consists of medical and dental services not covered by insurance, prescription drugs and medical supplies not covered by insurance, and health insurance premiums not paid by employer or other organizations.

Child care and education expenses consists of day care tuition and supplies; baby-sitting; and elementary and high school tuition, books, and supplies.

Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Source of Data

The 1990-92 Consumer Expenditure Survey (CE) is used to estimate expenditures on children. Administered by the Bureau of Labor Statistics (BLS), the CE collects information on socio-demographic characteristics, income, and expenditures of households.

The CE has been conducted annually since 1980 and interviews about 5,000 households each quarter over a 1-year period. Each quarter is deemed an independent sample by BLS; thus, the total number of households in the 1990-92 survey is about 60,000.

From these households, husband-wife and single-parent families were selected for this study if (1) they had at least one child of their own—age 17 or under—in the household, (2) they had six or fewer children, (3) there were no other related or unrelated people present in the household except their own children, and (4) they were complete income reporters. Complete income reporters are households that provide values for major sources of income, such as wages and salaries, self-employment income, and Social Security income. Quarterly expenditures were annualized. The sample consisted of 12,850 husband-wife households and 3,395 single-parent households. BLS weighting methods were used to weight the sample to reflect the U.S. population of interest. Although based on 1990-92 data, the expense estimates were updated to 1997 dollars using the Consumer Price Index (CPI-U). (Expenditure and income data for 1990 and 1991 were first converted to 1992 dollars; then all 3 years of data were updated to 1997 dollars.)

Methods

The CE collects overall household expenditure data for some budgetary components (housing, food, transportation, health care, and miscellaneous goods and services) and child-specific expenditure data for other components (clothing, child care, and education). Multivariate analysis was used to estimate household and child-specific expenditures. Income level, family size, and age of the younger child were controlled so that estimates could be made for families with these varying characteristics. Regional estimates were derived by controlling for region. The three income groups of husband-wife households were determined by dividing the sample for the overall United States into equal thirds. The income groups were before-tax income under $31,000, between $31,000

and $52,160, and over $52,160 in 1992 dollars.

For each income level, the estimates were for husband-wife families with two children. The younger child was in one of six age categories: 0-2, 3-5, 6-8, 9-11, 12-14, and 15-17 years. Households with four members (two children) were selected as the standard because in 1990-92 this was the average household size of two-parent families. The focus was on the younger child in a household because the older child was sometimes over age 17.

The estimates are based on CE interviews of households with and without specific expenses; so for some families, expenditures may be higher or lower than the mean estimates, depending on whether they incur the expense. This particularly applies to child care and education for which about 50 percent of families in the study had no expenditure. Also, the estimates only cover out-of-pocket expenditures on children made by the parents and not by others, such as grandparents or friends. For example, the value of clothing gifts to children from grandparents would not be included in clothing expenses. Likewise, some of the expenditures reported by parents may be gifts for children other than their own.

Regional income categories were based on the national income categories in 1992 dollars, updated to 1997 dollars using regional CPI's. The regional income categories were not divided into equal thirds for each region as was done for the overall United States.

After the various overall household and child-specific expenditures were estimated, these total amounts were allocated among the four family members (husband, wife, older child, and younger child).

The estimated expenditures for clothing and child care and education were only for children. It was assumed that these expenses were equally allocated to each child; therefore, the estimated expenditures were divided by two (the number of children in the household).

Because the CE did not collect expenditures on food and health care by family member, data from other Federal studies were used to apportion these budgetary components to children by age. Food budget shares as a percentage of total food expenditures—for the younger child in a husband-wife household with two children—were determined using the 1994 USDA food plans *(9)*. These shares were estimated by age of the child and household income level. The food budget shares were then applied to estimated household food expenditures to determine food expenses on children. Health care shares as a percentage of total health care expenses for the younger child in a husband-wife household with two children were calculated from the 1987 National Medical Expenditure Survey (NMES) *(5)*. These shares were estimated by age of the child and applied to estimated household health care expenditures to determine expenses on children.

No research base exists for allocating estimated household expenditures on housing, transportation, and miscellaneous goods and services among household members. Two of the most common approaches for allocating these expenses are the marginal cost method and the per capita method.

The marginal cost method measures expenditures on children as the difference in expenses between couples with children and equivalent childless couples. This method depends on development of an

equivalency measure; however, there is no universally accepted measure. Proposed methods have produced different estimates of expenditures on children.[3] Some of the marginal cost approaches assume that parents or couples do not alter expenditures on themselves after a child is added to a household. Also, couples without children often buy larger-than-needed homes at the time of purchase in anticipation of children. Comparing the expenditures of childless couples to expenditures of similar couples with children could lead to underestimated expenditures on children.

For these reasons, the USDA uses the per capita method to allocate housing, transportation, and miscellaneous goods and services among household members. The per capita method allocates expenses among household members in equal proportions. Although the per capita method has limitations, these limitations were considered less severe than those of the marginal cost approach.

A major limitation of the per capita method is that expenditures for an additional child may be less than average expenditures. Consequently, adjustment formulas were devised to estimate expenditures on one child or three or more children for households of different sizes. These formulas are discussed later in the paper. Transportation expenses resulting from employment activities are not related to expenses on children, so these costs were excluded from the estimated household transportation expenses. Data used to do this were from a 1990 U.S. Department of Transportation study *(12)*.

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[3]For a review of equivalency measures and estimates of expenditures on children resulting from them, see U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, 1990, Estimates of Expenditures on Children and Child Support Guidelines *(11)*.

Figure 1. Estimated 1997 annual family expenditures on a child, by before-tax income level and age of child[1]
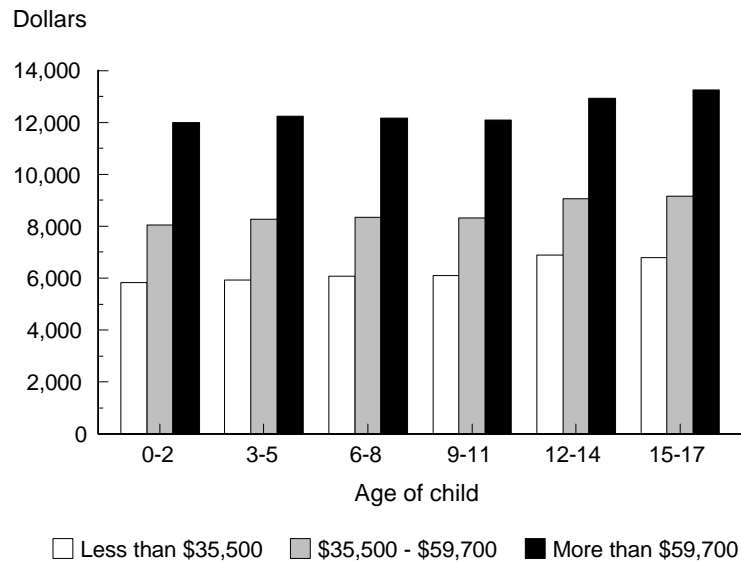
[1]U.S. average for the younger child in husband-wife families with two children.

Although the USDA uses the per capita approach rather than a marginal cost approach in allocating housing, transportation, and miscellaneous expenditures to children in a household, a USDA study *(6)* examined how these expenses would be allocated using different marginal cost approaches. These approaches produced estimates of expenditures on children for housing and miscellaneous goods and services below those produced by the per capita method. In addition, these approaches produce estimates of transportation expenditures on children above those produced by the per capita method.

Estimated Expenditures on Children by Husband-Wife Households

Estimates of family expenditures on the younger child in husband-wife households with two children for the overall United States, urban regions of the country, and overall rural areas are presented in tables 2 through 7 on pp. 37-43. Household income levels were updated to 1997 dollars using the all-items category of the CPI-U, and expenditures were updated using the CPI for the corresponding item (that is, the CPI's for housing, food, etc.). Regional estimates were updated to 1997 dollars using the regional CPI's. The following subsections highlight the child-rearing expense estimates for the younger child in a two-child household for the overall United States by income level, budgetary component, age of the child, and region.

Income Level
Estimated expenses on children vary considerably by household income level (fig. 1). Depending on age of the child, the annual expenses range from $5,820 to $6,880 for families in the lowest income group (1997 before-tax income less than $35,500), from $8,060 to $9,170

Figure 2. Estimated family expenditures on a child through age 17, by budgetary share[1]
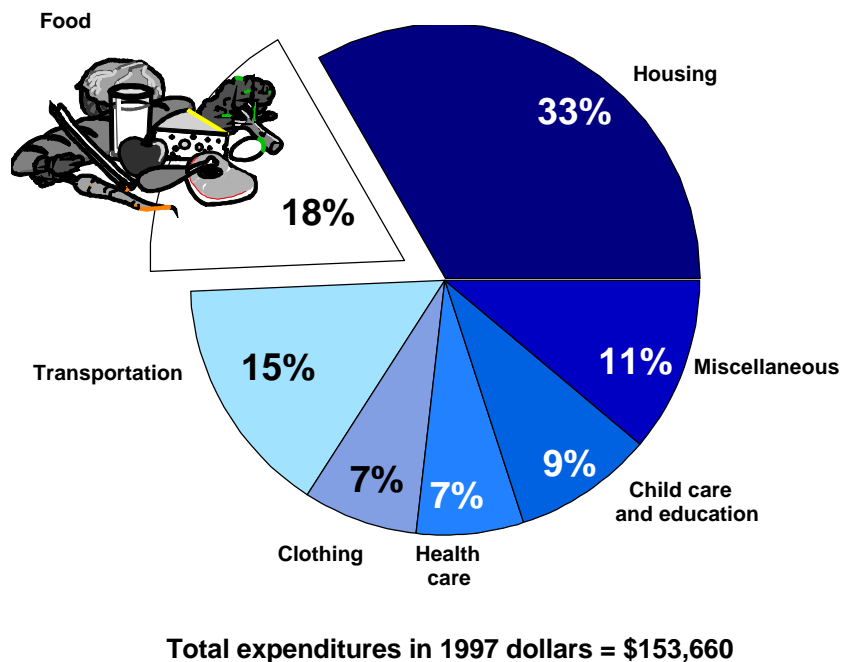
Total expenditures in 1997 dollars = $153,660

[1]U.S. average for the younger child in middle-income (1997 before-tax income between $35,500 and $59,700), husband-wife families with two children.

for families in the middle-income group (1997 before-tax income between $35,500 and $59,700), and from $11,990 to $13,260 for families in the highest income group (1997 before-tax income more than $59,700). On average, households in the lowest group spend 28 percent of their before-tax income per year on a child, those in the middle-income group, 18 percent, and those in the highest income group, 14 percent. The range in these percentages would be narrower if after-tax income were considered, because a greater proportion of income in higher income households goes toward taxes.

Although families in the highest income group spend slightly less than twice the amount that families in the lowest income group spend on a child, on average, the amount varies by budgetary component. In general, expenses on a child for goods and services considered to be necessities (such as food and clothing) do not vary as much as those considered to be discretionary (such as miscellaneous expenses) among households in the three income groups. For example, clothing expenses on a child age 15-17 average $670 in the lowest income group and $1,020 in the highest income group, a 52-percent difference. Miscellaneous

expenses on the same age child average $600 in the lowest income group and $1,530 in the highest income group, a 155-percent difference.

Budgetary Component
Housing accounts for the largest share of total child-rearing expenses; figure 2 shows this for families in the middle-income group. Based on an average for the six age groups, housing accounts for 33 percent of child-rearing expenses for a child in the lowest and middle-income groups and 37 percent in the highest income group. Food is the second largest average expense on a child for families regardless of income level. It accounts for 20 percent of child-rearing expenses for a child in the lowest income group, 18 percent in the middle-income group, and 15 percent in the highest income group. Transportation is the third largest child-rearing expense, making up 14 to 15 percent of child-rearing expenses across income levels.

Across the three income groups, miscellaneous goods and services (personal care items, entertainment, and reading materials) is the fourth largest expense on a child for families (10 to 13 percent). Clothing (except that received as gifts or hand-me-downs) accounts for 6 to 8 percent of expenses on a child for families, child care and education accounts for 7 to 10 percent, and health care, 5 to 7 percent of child-rearing expenses across income groups. Estimated expenditures for health care include only out-of-pocket expenses (including insurance premiums not paid by an employer or other organization) and not that portion covered by health insurance.

Figure 3. Estimated 1997 annual family expenditures on a child, by age and budgetary share[1]
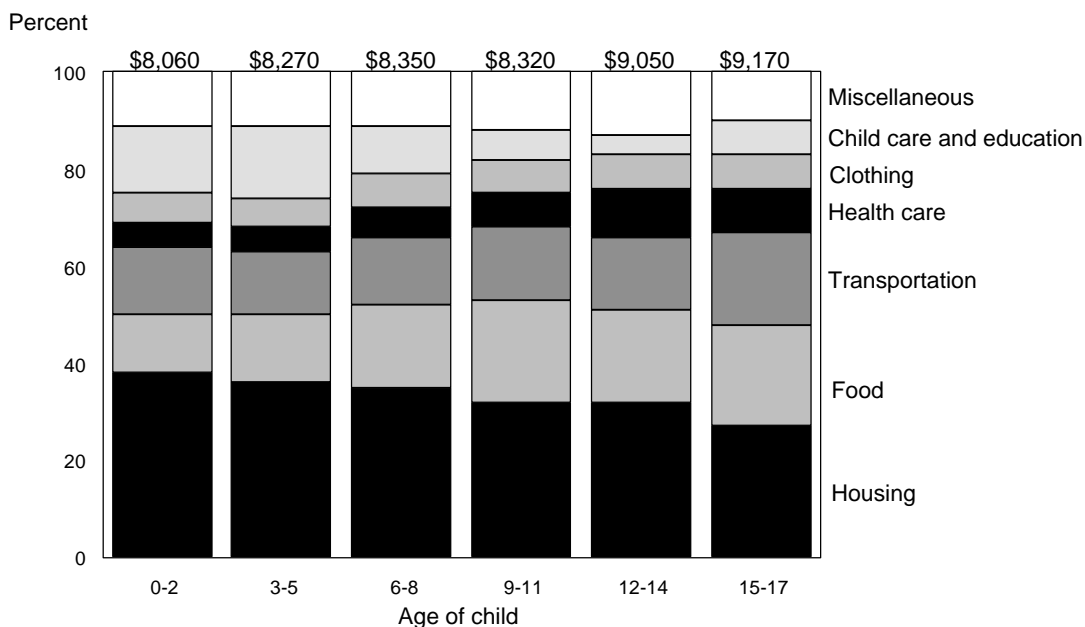
Figure 3. Percent (vertical axis); Age of child (horizontal axis). Values above bars: $8,060 (0-2), $8,270 (3-5), $8,350 (6-8), $8,320 (9-11), $9,050 (12-14), $9,170 (15-17). Categories (top to bottom): Miscellaneous, Child care and education, Clothing, Health care, Transportation, Food, Housing.

[1]U.S. average for the younger child in middle-income (1997 before-tax income between $35,500 and $59,700), husband-wife families with two children.

Age of Child

Expenditures on a child are lower in the younger age categories and higher in the older age categories. Figure 3 depicts this for families in the middle-income group. This held across income groups even though housing expenses, the highest child-rearing expenditure, generally decline as the child grows older. The decline in housing expenses reflects diminishing interest paid by homeowners over the life of a mortgage. Payments on principal are not considered part of housing costs in the CE; they are deemed to be part of savings.

Child-rearing food, transportation, clothing, and health care expenses generally increase over the age of a child for all three income groups. Transportation expenses are highest for a child age 15-17, when he or she would start driving. Child

care and education expenses are highest for a child under age 6. Most of this expense may be attributable to child care at this age. The estimated expense for child care and education may seem low for those with the expense. The estimates reflect the average of households with and without the expense.

Region

Child-rearing expenses in the various regions of the country reflect patterns observed in the overall United States: in each region, expenses on a child increase with household income level, and generally, with age of the child. Overall child-rearing expenses are highest in the urban West, followed by the urban Northeast, and urban South. Figure 4 shows total child-rearing expenses by region and age of a child for middle-income families. Child-rearing expenses

are lowest in the urban Midwest and rural areas. Much of the difference in expenses on a child among regions is related to housing costs. Total housing expenses on a child are highest in the urban West and urban Northeast and lowest in rural areas. However, child-rearing transportation expenses are highest for families in rural areas. This likely reflects the longer traveling distances and the lack of public transportation in these areas.

Adjustments for Older Children and Household Size

The expense estimates on a child represent expenditures on the younger child at various ages in a husband-wife household with two children. It cannot be assumed that expenses on the older child are the same at these various ages.

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Figure 4. Estimated 1997 annual family expenditures on a child, by region and age[1]
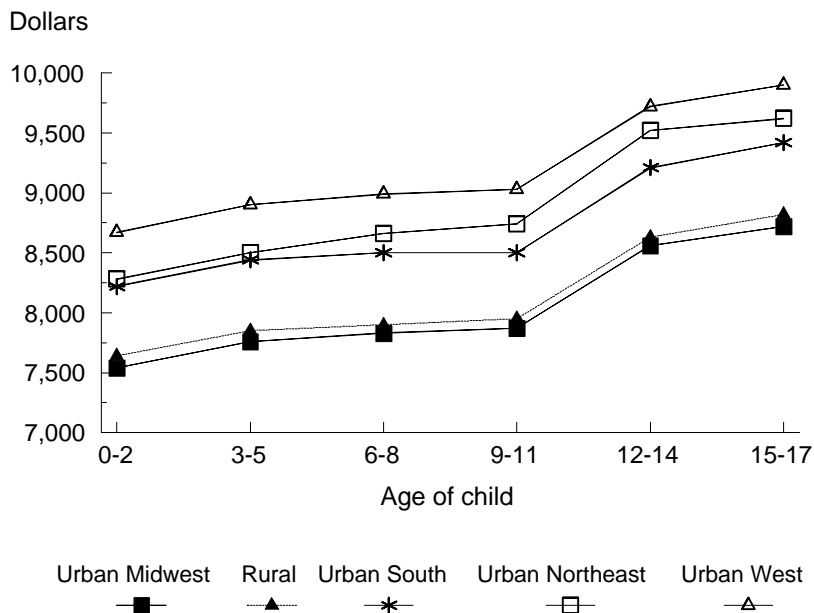
Dollars

Age of child

| Urban Midwest | Rural | Urban South | Urban Northeast | Urban West |

[1]U.S. average for the younger child in middle-income, husband-wife families with two children. For the urban West, the middle-income group had a 1997 before-tax income between $35,200 and $59,300; for the urban Northeast, between $35,300 and $59,300; for the urban South, between $35,600 and $60,000; for the urban Midwest, between $35,700 and $60,100; and for rural areas, between $35,900 and $60,400.

Expenses may vary by birth order. To determine whether a difference exists, the extent of this difference, and how the expenditures may be adjusted to estimate expenses on an older child, the method described on pp. 26-28 was repeated. The focus was on the older child in each of the same age categories as those used with the younger child. A two-child family was again used as the standard. Household income and region of residence were not held constant, so findings are applicable to all families.

On average, for husband-wife households with two children, expenditures do not vary by birth order. So, the expenditures in tables 2 through 7 reflect those on either child in a two-child family. Thus, annual expenditures on children in a husband-wife, two-child family may be estimated by summing the expenses for the two appropriate age categories. For example, annual expenditures on children ages 9-11 and 15-17 in a husband-wife family in the middle-income group for the overall United States would be $17,490 ($8,320 + $9,170). For specific budgetary components, annual expenses on an older child vary, compared with those on a younger child: families spend more on clothing and education for an older child but less on transportation.

...families spend more on clothing and education for an older child but less on transportation.

Expenditures on Children Over Time

Since 1960, the U.S. Department of Agriculture (USDA) has been providing estimates of expenditures on children from birth through age 17. The original estimates were based on the 1960 Consumer Expenditure Survey. The figure below examines how these expenditure estimates have changed over time at 5-year intervals. Depicted are the average total expenditures on a child from birth through age 17 in a middle-income, husband-wife family. Expenditures are in nominal (not adjusted for inflation) dollars.

Expenses to raise a child to age 18 have increased dramatically, from $25,230 in 1960 to $153,660 in 1997. Even when adjusted for inflation and converted to 1997 dollars, real expenditures on children have risen—from about $136,800 in 1960. New components of child-rearing costs, particularly child care, are among factors causing this increase. In 1960, child care expenses were negligible because many mothers were not in the labor force. In 1997, child care expenses were among the largest expenditures made on preschool children by middle-income families.

The original intent of USDA's research on expenditures on children was primarily educational: expenditure estimates on child-rearing were to be used in financial planning guides and budgeting programs. Although still used for this purpose, the child-rearing expense estimates have gained new applications, such as in developing State child support guidelines and foster care payments. These new uses of the child-rearing expense estimates reflect the changing structure of families with children in the United States and thus the importance of the ongoing nature of this research area.

Total expenditures on a child for the first 18 years of life[1]
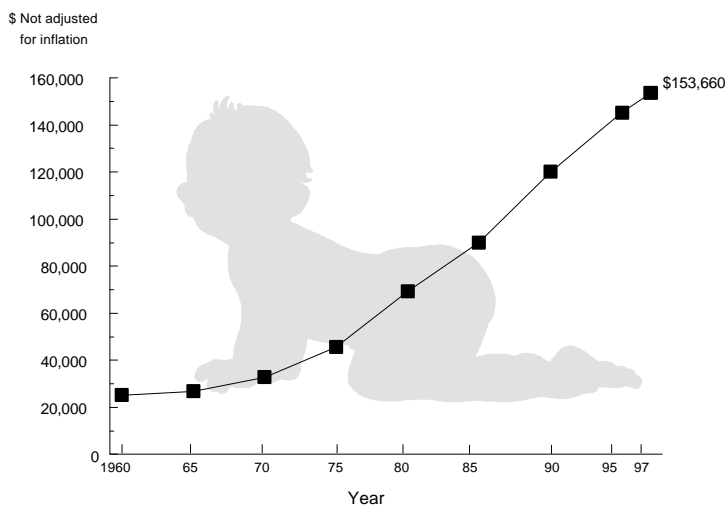
[1]Average expenditures for a middle-income, husband-wife family, not adjusted for inflation.

The estimates should also be adjusted if a household has only one child or more than two children. Families will spend more or less on a child depending on the number of other children in the household and economies of scale. Multivariate analysis was used to estimate expenditures for each budgetary component to derive these estimates. Household size and age of the younger child were controlled for; household income level and region of the country were not. The results, therefore, are applicable to all families. These expenditures were then assigned to a child using the method described earlier. Compared with expenditures for each child in a husband-wife, two-child family, expenditures for the child in a one-child family average 24 percent more and for those with three or more children, 23 percent less on each child.

Therefore, to adjust the figures in tables 2 through 7 to estimate annual overall expenditures on an only child, users of this report should add 24 percent to the total expense for the child's age category. To estimate expenditures on three or more children, users should subtract 23 percent from the total expense for each child's age category, and sum the totals. As an example of adjustments needed for different numbers of children, the total expenses for a middle-income family in the overall United States on a child age 15-17 with no siblings would be $11,370 ($9,170 x 1.24) and the total expenses on three children ages 3-5, 12-14, and 15-17 would be $20,400 (($8,270 + $9,050 + $9,170) x .77). For a particular budgetary component, the percentages may be more or less. As family size increases, food costs per child decrease less than housing and transportation costs per child decrease.

Estimating Future Costs

The estimates presented in this study represent household expenditures on a child of a certain age in 1997. To estimate these expenses for the first 17 years, future price changes need to be incorporated in the figures. To do this, a future cost formula is used such that:

$$C_f = C_p (1 + i)^n$$

where:

C_f = projected future annual dollar expenditure on a child of a particular age
C_p = present (1997) annual dollar expenditure on a child of a particular age
i = projected annual inflation (or deflation)
n = number of years from present until child will reach a particular age

An example of estimated future expenditures on the younger child in a husband-wife family with two children for each of the three income groups for the overall United States is presented. The example assumes a child is born in 1997 and reaches age 17 in the year 2014. The example also assumes that the average annual inflation rate over this time is 5.0 percent (the average annual inflation rate over the past 20 years) *(10)*. Thus, total family expenses on a child through age 17 would be $178,840, $242,890, and $353,130 for households in the lowest, middle-, and highest income groups, respectively. In 1997 dollars, these figures would be $112,710, $153,660, and $224,040.

Inflation rates other than 5.0 percent could be used in the formula if projections of these rates vary in the future. Also, it is somewhat unrealistic to assume that households remain in one income category as a child ages. For most families, income rises over time. In addition, such projections assume child-rearing expenditures change only with inflation, but parental expenditure patterns also change over time.

Estimated annual expenditures on a child born in 1997, by income group[1]

| Year | Age | Income group | | |
		Lowest	Middle	Highest
1997	<1	$5,820	$8,060	$11,990
1998	1	6,110	8,460	12,590
1999	2	6,420	8,890	13,220
2000	3	6,850	9,570	14,160
2001	4	7,200	10,050	14,870
2002	5	7,560	10,550	15,610
2003	6	8,130	11,190	16,320
2004	7	8,540	11,750	17,140
2005	8	8,970	12,340	18,000
2006	9	9,450	12,910	18,760
2007	10	9,920	13,550	19,690
2008	11	10,420	14,230	20,680
2009	12	12,360	16,250	23,220
2010	13	12,970	17,070	24,380
2011	14	13,620	17,920	25,600
2012	15	14,120	19,060	27,570
2013	16	14,820	20,020	28,940
2014	17	15,560	21,020	30,390
Total		**$178,840**	**$242,890**	**$353,130**

[1] Estimates are for the younger child in husband-wife families with two children for the overall United States.

Table 1. A comparison of estimated 1997 expenditures on a child by lower income single-parent and husband-wife families[1]

Age of child	Single-parent households	Husband-wife households
0 - 2	$4,900	$5,820
3 - 5	5,510	5,920
6 - 8	6,230	6,070
9 - 11	5,820	6,090
12 - 14	6,270	6,880
15 - 17	6,970	6,790
Total (0 - 17)	**$107,100**	**$112,710**

[1]Estimates are for the younger child in two-child families in the overall United States with 1997 before-tax income less than $35,500.

Expenditures by Single-Parent Families

The estimates of expenditures on children by husband-wife families do not apply to single-parent families, a group that accounts for an increasing percentage of families with children. Therefore, separate estimates of child-rearing expenses in single-parent households were made using the CE data. Most single-parent families in the survey were headed by a woman: 90 percent.

The method used in determining child-rearing expenses for two-parent house-holds was followed. Multivariate analysis was used to estimate expenditures for each budgetary component. Control variables were income level, household size, and age of the younger child (the same age categories as used with children in two-parent families). A single parent with two children was used as the standard for household size.

Income groups of single-parent house-holds (before-tax income under $31,000 and $31,000 and over in 1992 dollars, inflated to 1997 dollars) were selected to correspond with the income groups used in estimating child-rearing expenditures in husband-wife households. This income includes child support payments. The two higher income groups of two-parent families (income between $31,000 and $52,160 and over $52,160 in 1992 dollars) were combined because only 17 percent of single-parent households had a before-tax income of $31,000 and over. The sample was weighted to reflect the U.S. population of interest.

Children's clothing and child care and education expenditures were divided between the two children in the one-parent household. For food and health care, household member shares were calculated for a three-member household (single parent and two children, with the younger child in one of the six age categories). The USDA food plans and the 1987 National Medical Expenditure Survey findings were used. These shares for the younger child in a single-parent family were then applied to estimated food and health care expenditures to determine expenses on the younger child in each age category.

Housing, transportation, and miscellaneous expenditures were allocated among household members on a per capita basis. Transportation expenses were adjusted to account for nonemployment-related activities in single-parent families. Income and expenses were updated to 1997 dollars.

Child-rearing expense estimates for single-parent families are in table 8, p. 43. For the lower income group (1997 before-tax income less than $35,500), a comparison of estimated expenditures on the younger child in a single-parent family with two children with those of the younger child in a husband-wife family with two children is presented in table 1. As discussed earlier, 83 percent of single-parent families and 33 percent of husband-wife families were in this lower income group. More single-parent than husband-wife families were in the bottom range of this lower income group. Average income for single-parent families in the lower income group is $14,800; for husband-wife families it is $22,100. However, total expenditures on a child through age 17 are, on average, only 5 percent lower in single-parent households than in two-parent households.

Single-parent families in this lower income group, therefore, spend a larger proportion of their income on children than do two-parent families. On average, housing expenses are higher; whereas, transportation, health care, child care and education, and miscellaneous expenditures on a child are lower in single-parent than in husband-wife households. Child-related food and clothing expenditures are similar, on average, in single- and two-parent families.

For the higher income group of single-parent families (1997 before-tax income of $35,500 and over), child-rearing expense estimates are about the same as those for two-parent households in the before-tax income group of $59,700 and over. Total expenses, in 1997 dollars, for the younger child through age 17 are $225,360 for single-parent families versus $224,040 for husband-wife families. Child-rearing expenses for the higher income group of single-parent families, therefore, also are a larger proportion of income than they are in husband-wife families. Thus, expenditures on children do not differ much between single-parent and husband-wife households. What differs is household income levels. Because single-parent families have one less potential earner than do husband-wife families, on average, their total household income is lower and child-rearing expenses are a greater percentage of this income.

Estimates cover only out-of-pocket child-rearing expenditures made by the parent with primary care of the child and do not include child-related expenditures made by the parent without primary care or made by others, such as grandparents. Such expenditures could not be estimated from the data. Overall expenses by both parents on a child in a single-parent household are likely greater than this study's estimates.

The procedure detailed earlier was repeated to determine the extent of the difference in expenditures on an older child in single-parent households. The focus was on the older child, and a family with two children was used as the standard. On average, single-parent households with two children spend 7 percent less on the older than on the younger child (in addition to age-related differences). This contrasts with husband-wife households whose expenditures are unaffected by birth order.

As with husband-wife households, single-parent households spend more or less if there is only one child or three or more children. Multivariate analysis was used to estimate expenditures for each budgetary component in order to determine these differences. Household size and age of the younger child were control variables. Expenditures were then assigned to a child using the method described earlier. Compared with expenditures for the younger child in a single-parent, two-child family, expenditures for one child in a single-parent household average 35 percent more on the single child, and those with three or more children average 28 percent less on each child.

Other Expenditures on Children

Expenditures on a child estimated in this study are composed of direct parental expenses made on a child through age 17 for seven major budgetary components. These direct expenditures exclude costs related to childbirth and prenatal health care. In 1995, these particular health care costs averaged $6,378 for a normal delivery and $10,638 for a cesarean delivery *(3)*. These costs may be reduced by health insurance.

One of the largest expenses made on children after age 17 is the cost of a college education. The College Board *(2)* estimates that in 1997-98, average annual tuition and fees are $3,027 at 4-year public colleges and $11,721 at 4-year private colleges. Annual room and board is $4,152 at 4-year public colleges and $4,883 at 4-year private colleges. For 2-year colleges in 1997-98, average annual tuition and fees are $1,538 at public colleges and $7,100 at

private colleges. Annual room and board is $4,240 at 2-year private colleges. No estimates are given for 2-year public colleges. Other parental expenses on children after age 17 include those associated with children living at home or, if children do not live at home, gifts and other contributions to them.

The estimates do not include all government expenditures on children. Examples of excluded expenses would be public education, Medicaid, and school meals. The actual expenditures on children (by parents and the government) would be higher than reported in this study, especially for the lowest income group.

Indirect child-rearing costs are also not included in the estimates. Although these costs are typically more difficult to measure than are direct expenditures, they can be substantial. The time involved in rearing children is considerable. In addition, one or both parents may need to cut back on hours spent in the labor force to care for children, thus reducing current earnings and future career opportunities. The indirect costs of child rearing may exceed the direct costs. For more on these indirect costs, see Bryant et al. *(1),* Ireland and Ward *(4),* Longman *(7),* and Spalter-Roth and Hartmann *(8).*

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Table 2. Estimated annual expenditures* on a child by husband-wife families, overall United States, 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[†]
Before-tax income: Less than $35,500 (Average=$22,100)								
0-2	$5,820	$2,220	$830	$730	$370	$400	$690	$580
3-5	5,920	2,190	920	700	360	380	780	590
6-8	6,070	2,120	1,190	820	410	440	460	630
9-11	6,090	1,910	1,420	890	450	480	280	660
12-14	6,880	2,130	1,490	1,000	760	480	200	820
15-17	6,790	1,720	1,610	1,350	670	510	330	600
Total	$112,710	$36,870	$22,380	$16,470	$9,060	$8,070	$8,220	$11,640
Before-tax income: $35,500 to $59,700 (Average=$47,200)								
0-2	$8,060	$3,000	$990	$1,090	$440	$520	$1,130	$890
3-5	8,270	2,970	1,140	1,060	430	500	1,260	910
6-8	8,350	2,900	1,460	1,180	480	570	810	950
9-11	8,320	2,700	1,710	1,250	530	620	530	980
12-14	9,050	2,920	1,730	1,360	890	620	390	1,140
15-17	9,170	2,500	1,920	1,720	790	660	660	920
Total	$153,660	$50,970	$26,850	$22,980	$10,680	$10,470	$14,340	$17,370
Before-tax income: More than $59,700 (Average=$89,300)								
0-2	$11,990	$4,770	$1,310	$1,520	$580	$600	$1,710	$1,500
3-5	12,230	4,740	1,480	1,490	570	580	1,860	1,510
6-8	12,180	4,670	1,790	1,610	620	660	1,280	1,550
9-11	12,090	4,470	2,080	1,680	680	710	890	1,580
12-14	12,930	4,690	2,180	1,790	1,120	710	690	1,750
15-17	13,260	4,270	2,300	2,180	1,020	750	1,210	1,530
Total	$224,040	$82,830	$33,420	$30,810	$13,770	$12,030	$22,920	$28,260

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, these totals should be summed.

†Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 3. Estimated annual expenditures* on a child by husband-wife families, urban West,[†] 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[‡]
Before-tax income: Less than $35,200 (Average=$22,000)								
0-2	$6,420	$2,650	$900	$790	$360	$340	$700	$680
3-5	6,560	2,630	1,000	770	350	320	790	700
6-8	6,730	2,600	1,290	880	390	370	470	730
9-11	6,820	2,450	1,540	950	430	400	280	770
12-14	7,570	2,630	1,610	1,070	720	410	200	930
15-17	7,520	2,260	1,740	1,410	640	430	330	710
Total	$124,860	$45,660	$24,240	$17,610	$8,670	$6,810	$8,310	$13,560
Before-tax income: $35,200 to $59,300 (Average=$46,900)								
0-2	$8,670	$3,410	$1,060	$1,160	$420	$460	$1,160	$1,000
3-5	8,900	3,390	1,220	1,140	410	440	1,280	1,020
6-8	8,990	3,350	1,560	1,250	460	500	820	1,050
9-11	9,030	3,210	1,840	1,310	510	540	530	1,090
12-14	9,720	3,390	1,840	1,440	850	550	400	1,250
15-17	9,900	3,020	2,050	1,790	750	580	680	1,030
Total	$165,630	$59,310	$28,710	$24,270	$10,200	$9,210	$14,610	$19,320
Before-tax income: More than $59,300 (Average=$88,700)								
0-2	$12,450	$5,040	$1,370	$1,600	$550	$540	$1,760	$1,590
3-5	12,740	5,030	1,550	1,580	540	520	1,910	1,610
6-8	12,680	4,990	1,870	1,680	590	590	1,320	1,640
9-11	12,630	4,840	2,180	1,750	640	630	910	1,680
12-14	13,430	5,020	2,280	1,870	1,070	640	710	1,840
15-17	13,800	4,650	2,400	2,250	960	670	1,240	1,630
Total	$233,190	$88,710	$34,950	$32,190	$13,050	$10,770	$23,550	$29,970

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The regional Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, these totals should be summed.

†The Western region consists of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

‡Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 4. Estimated annual expenditures* on a child by husband-wife families, urban Northeast,[†] 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[‡]
Before-tax income: Less than $35,300 (Average=$22,000)								
0-2	$6,100	$2,650	$930	$610	$400	$390	$560	$560
3-5	6,210	2,640	1,020	580	390	370	630	580
6-8	6,420	2,600	1,310	690	430	420	360	610
9-11	6,570	2,450	1,570	760	480	450	210	650
12-14	7,390	2,630	1,640	880	820	460	150	810
15-17	7,300	2,260	1,760	1,220	720	490	250	600
Total	$119,970	$45,690	$24,690	$14,220	$9,720	$7,740	$6,480	$11,430
Before-tax income: $35,300 to $59,300 (Average=$46,900)								
0-2	$8,280	$3,410	$1,080	$980	$470	$510	$950	$880
3-5	8,500	3,390	1,240	960	460	490	1,060	900
6-8	8,660	3,360	1,580	1,060	510	560	660	930
9-11	8,740	3,210	1,850	1,130	560	600	420	970
12-14	9,520	3,390	1,860	1,260	950	610	310	1,140
15-17	9,620	3,020	2,060	1,610	850	640	520	920
Total	$159,960	$59,340	$29,010	$21,000	$11,400	$10,230	$11,760	$17,220
Before-tax income: More than $59,300 (Average=$88,800)								
0-2	$12,010	$5,050	$1,380	$1,420	$610	$600	$1,480	$1,470
3-5	12,260	5,030	1,560	1,400	590	570	1,620	1,490
6-8	12,300	4,990	1,880	1,510	650	650	1,090	1,530
9-11	12,320	4,840	2,190	1,580	710	700	740	1,560
12-14	13,190	5,020	2,280	1,700	1,180	710	570	1,730
15-17	13,430	4,650	2,410	2,070	1,070	740	980	1,510
Total	$226,530	$88,740	$35,100	$29,040	$14,430	$11,910	$19,440	$27,870

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The regional Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, these totals should be summed.

†The Northeast region consists of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

‡Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 5. Estimated annual expenditures* on a child by husband-wife families, urban South,[†] 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[‡]
Before-tax income: Less than $35,600 (Average=$22,200)								
0-2	$5,890	$2,190	$800	$720	$400	$450	$780	$550
3-5	6,030	2,170	900	700	390	430	870	570
6-8	6,140	2,130	1,160	800	430	490	530	600
9-11	6,220	1,980	1,410	870	480	520	320	640
12-14	7,020	2,170	1,470	1,000	800	540	230	810
15-17	6,970	1,790	1,600	1,330	710	560	390	590
Total	$114,810	$37,290	$22,020	$16,260	$9,630	$8,970	$9,360	$11,280
Before-tax income: $35,600 to $60,000 (Average=$47,400)								
0-2	$8,220	$2,960	$970	$1,090	$470	$590	$1,270	$870
3-5	8,440	2,940	1,120	1,070	460	560	1,400	890
6-8	8,500	2,910	1,430	1,170	510	640	910	930
9-11	8,500	2,760	1,700	1,240	560	680	600	960
12-14	9,210	2,940	1,710	1,360	930	690	450	1,130
15-17	9,420	2,560	1,910	1,720	830	720	770	910
Total	$156,870	$51,210	$26,520	$22,950	$11,280	$11,640	$16,200	$17,070
Before-tax income: More than $60,000 (Average=$89,700)								
0-2	$12,080	$4,630	$1,270	$1,530	$610	$680	$1,890	$1,470
3-5	12,360	4,610	1,450	1,510	600	650	2,050	1,490
6-8	12,280	4,580	1,750	1,610	650	740	1,430	1,520
9-11	12,200	4,420	2,040	1,680	710	780	1,010	1,560
12-14	13,020	4,610	2,140	1,800	1,160	800	790	1,720
15-17	13,440	4,230	2,260	2,170	1,060	820	1,390	1,510
Total	$226,140	$81,240	$32,730	$30,900	$14,370	$13,410	$25,680	$27,810

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The regional Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, these totals should be summed.

†The Southern region consists of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

‡Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 6. Estimated annual expenditures* on a child by husband-wife families, urban Midwest,[†] 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[‡]
Before-tax income: Less than $35,700 (Average=$22,300)								
0-2	$5,270	$1,970	$760	$640	$350	$360	$670	$520
3-5	5,400	1,960	850	620	340	340	750	540
6-8	5,540	1,920	1,100	720	380	390	450	580
9-11	5,640	1,770	1,340	790	430	430	270	610
12-14	6,400	1,950	1,400	920	720	440	190	780
15-17	6,330	1,570	1,530	1,260	630	460	320	560
Total	$103,740	$33,420	$20,940	$14,850	$8,550	$7,260	$7,950	$10,770
Before-tax income: $35,700 to $60,100 (Average=$47,500)								
0-2	$7,540	$2,740	$920	$1,010	$420	$490	$1,110	$850
3-5	7,760	2,730	1,070	990	410	460	1,230	870
6-8	7,830	2,690	1,370	1,100	450	530	790	900
9-11	7,870	2,540	1,640	1,170	500	570	510	940
12-14	8,560	2,720	1,640	1,290	850	580	380	1,100
15-17	8,720	2,340	1,840	1,650	750	600	650	890
Total	$144,840	$47,280	$25,440	$21,630	$10,140	$9,690	$14,010	$16,650
Before-tax income: More than $60,100 (Average=$89,900)								
0-2	$11,350	$4,410	$1,230	$1,460	$550	$570	$1,690	$1,440
3-5	11,620	4,390	1,400	1,440	540	550	1,840	1,460
6-8	11,550	4,350	1,690	1,540	590	620	1,260	1,500
9-11	11,500	4,200	1,980	1,610	640	660	870	1,540
12-14	12,330	4,390	2,070	1,740	1,070	680	680	1,700
15-17	12,650	4,010	2,190	2,110	970	700	1,190	1,480
Total	$213,000	$77,250	$31,680	$29,700	$13,080	$11,340	$22,590	$27,360

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The regional Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, t hese totals should be summed.

†The Midwest region consists of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

‡Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 7. Estimated annual expenditures* on a child by husband-wife families, Rural areas,[†] 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[‡]
Before-tax income: Less than $35,900 (Average=$22,400)								
0-2	$5,310	$1,660	$770	$830	$360	$440	$700	$550
3-5	5,460	1,650	870	810	350	420	790	570
6-8	5,600	1,610	1,130	920	390	480	470	600
9-11	5,690	1,450	1,370	990	440	520	280	640
12-14	6,460	1,640	1,430	1,110	750	530	200	800
15-17	6,410	1,260	1,560	1,460	660	550	330	590
Total	$104,790	$27,810	$21,390	$18,360	$8,850	$8,820	$8,310	$11,250
Before-tax income: $35,900 to $60,400 (Average=$47,800)								
0-2	$7,640	$2,450	$940	$1,210	$430	$580	$1,160	$870
3-5	7,850	2,430	1,090	1,180	420	550	1,290	890
6-8	7,900	2,390	1,390	1,290	460	630	820	920
9-11	7,950	2,240	1,660	1,360	520	670	540	960
12-14	8,630	2,420	1,660	1,480	870	680	400	1,120
15-17	8,820	2,040	1,860	1,840	780	710	680	910
Total	$146,370	$41,910	$25,800	$25,080	$10,440	$11,460	$14,670	$17,010
Before-tax income: More than $60,400 (Average=$90,500)								
0-2	$11,470	$4,130	$1,240	$1,650	$560	$670	$1,760	$1,460
3-5	11,750	4,120	1,410	1,630	550	640	1,920	1,480
6-8	11,680	4,080	1,710	1,730	600	730	1,320	1,510
9-11	11,630	3,930	2,000	1,800	660	770	920	1,550
12-14	12,450	4,110	2,100	1,930	1,100	790	710	1,710
15-17	12,800	3,730	2,220	2,310	990	810	1,240	1,500
Total	$215,340	$72,300	$32,040	$33,150	$13,380	$13,230	$23,610	$27,630

Estimates are based on 1990-92 Consumer Expenditure Survey data. The population size Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child. Therefore, to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.24. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.77. For expenses on all children in a family, these totals should be summed.

†Rural areas are places of fewer than 2,500 people outside a Metropolitan Statistical Area.

‡Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Table 8. Estimated annual expenditures* on a child by single-parent families, overall United States, 1997

Age of child	Total	Housing	Food	Transpor-tation	Clothing	Health care	Child care and education	Miscel-laneous[†]
Before-tax income: Less than $35,500 (Average=$14,800)								
0-2	$4,900	$1,990	$920	$680	$340	$190	$430	$350
3-5	5,510	2,260	960	600	360	280	590	460
6-8	6,230	2,410	1,220	690	420	330	540	620
9-11	5,820	2,310	1,410	500	430	420	260	490
12-14	6,270	2,310	1,410	580	720	450	320	480
15-17	6,970	2,450	1,540	900	840	440	250	550
Total	$107,100	$41,190	$22,380	$11,850	$9,330	$6,330	$7,170	$8,850
Before-tax income: $35,500 or more (Average=$53,900)								
0-2	$11,210	$4,290	$1,410	$2,080	$480	$440	$1,060	$1,450
3-5	12,030	4,560	1,500	2,000	500	590	1,330	1,550
6-8	12,800	4,700	1,800	2,090	580	680	1,240	1,710
9-11	12,380	4,610	2,160	1,900	580	810	730	1,590
12-14	13,120	4,610	2,120	1,970	960	860	1,030	1,570
15-17	13,580	4,750	2,240	2,140	1,110	850	840	1,650
Total	$225,360	$82,560	$33,690	$36,540	$12,630	$12,690	$18,690	$28,560

*Estimates are based on 1990-92 Consumer Expenditure Survey data. The Consumer Price Index is used to update income and expenditures to 1997 dollars. The figures represent estimated expenses on the younger child in a single-parent, two-child family. For estimated expenses on the older child, multiply the total expense for the appropriate age category by 0.93. To estimate expenses for two children, the expenses on the younger child and older child----after adjusting the expense on the older child downward----should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.35. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.72----after adjusting the expenses on the older children downward. For expenses on all children in a family, these totals should be summed.

†Miscellaneous expenses consists of personal care items, entertainment, and reading materials.

Changes in Children's Total Fat Intakes and Their Food Group Sources of Fat, 1989-91 Versus 1994-95: Implications for Diet Quality

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The *1995 Dietary Guidelines for Americans* recommends that children 2 through 5 years old should gradually adopt a diet that contains no more than 30 percent of calories from fat and continue this diet throughout life. This study compares total fat intakes of children 2 to 17 years old in 1989-91 to intakes in 1994-95 to determine if improvement took place. The U.S. Department of Agriculture's 1989-91 and 1994-95 Continuing Survey of Food Intakes by Individuals was used. Overall nutrient intake and food group consumption patterns were also compared. Although grams of fat consumed increased over the periods, percentage of calories from fat declined due to increased caloric intake, particularly from carbohydrates. Children consumed less dairy products overall but more low-fat milks. Grain consumption rose, but the grain products consumed were not any lower in fat over the years studied. Beverage consumption, particularly soft drinks, rose, especially for adolescent males and contributed importantly to an increase in carbohydrate consumption. When assessing progress in meeting fat recommendations, professionals need to consider overall diet quality.

E xcess fat consumption in American diets is a concern and has been associated with heart disease, certain cancers, obesity, and gall bladder disease *(4)*. To lower the risks of these health problems, the *1995 Dietary Guidelines for Americans* emphasizes that children 2 through 5 years old should gradually adopt a diet containing no more than 30 percent of calories from fat and continue this diet throughout life *(18)*. To target behaviors that need to be changed to meet the *Dietary Guidelines for Americans*, we need to examine children's dietary patterns. By comparing current survey estimates of food and nutrient intakes with those of prior surveys, we can identify changes in diet over time to determine if children are making progress toward meeting current dietary advice.

This study compares total fat intakes by age/gender groups of children 2 to 17 years of age in 1989-91 to intakes in 1994-95 to determine if improvement took place. Also, overall nutrient intake patterns and consumption patterns of selected food groups are examined. Increasing our understanding of changes in dietary patterns that contributed to changes in children's overall fat intakes can help professionals develop nutrition education and promotion efforts for 2- to 17-year-olds.

Methods

The Continuing Survey of Food Intakes by Individuals
Data for this study were from the U.S. Department of Agriculture's (USDA) 1989-91 and 1994-95 Continuing Survey of Food Intakes by Individuals (CSFII). The CSFII was designed to obtain a nationally representative sample of

noninstitutionalized persons residing in households in the United States. Persons living in group quarters or institutions, residing on military installations or staying in shelters or otherwise were excluded. For both surveys, USDA developed sample weights to compensate for variable probabilities of selection, differential nonresponse rates, and sampling frame considerations. Use of weighted data provides results that are more generalizable to the U.S. population.

For the 1989-91 CSFII, food intake data were collected for 3 consecutive days and were obtained by a 1-day recall and 2-day record during two personal visits by trained interviewers *(12)*. The 1989-91 CSFII included two separate samples, all income and low income, which were combined through sample weights. The low-income sample consisted of individuals with household income at or below 130 percent of the Federal poverty thresholds. The survey includes information on food and nutrient intakes by 15,200 individuals.

For the 1994-95 CSFII, 2 nonconsecutive days of dietary data for individuals of all ages were collected using the 24-hour recall method. The data were collected from selected individuals in each household rather than from all household members, as had been done previously. The method for collecting the 24-hour recall was also modified to improve the collection of dietary intake data and included more questions that probed the respondents' recollections *(13,14)*. The low-income population was oversampled, with low-income defined as individuals in households with gross income for the previous month at or below 130 percent of the Federal poverty thresholds. The population of inference was individuals in households in the entire United States rather than the 48 coterminous States

and Washington, DC, as had been the case in the 1989-91 survey. The 1994 survey includes information on food and nutrient intakes by 5,589 individuals who provided at least 1 day of dietary data *(13)* and the 1995 survey, 1-day intake data by 5,326 individuals *(14)*.

Sample
The unweighted sample for this study consisted of children 2 to 17 years old who provided valid 1-day recall of dietary intake: 3,834 from the 1989-91 CSFII and 3,318 from the 1994-95 CSFII. Only the first day of dietary intake data was used because Day 1 data for 1989-91 and 1994-95 were collected using the 24-hour recall method. Methods of data collection used on subsequent days were not as comparable. We examined data on children in four age/gender groups: Preschoolers (aged 2-5), primary schoolers (aged 6-11), male adolescents (aged 12-17), and female adolescents (aged 12-17).

Food Groups
Five major food categories were examined: Dairy products, meat, grains, fats and sugars, and an "other" food category. Foods in the "other" category were eggs and egg mixtures; nuts and seeds; legumes; fruits, including fruit juices; fruit juice bars and sorbets; vegetables, including potato chips; sugars; syrups; candies, popsicles, chewing gum; and beverages, including soft drinks. We chose these food categories because they are typically the main sources of dietary fat. Initially, we examined the traditional Food Guide Pyramid groups, but several food groups were not major sources of fat (e.g., vegetables), and these were placed in the "other" category. Thus, for this paper, food categories are different from those in the Food Guide Pyramid.

. . .while fat intakes as a percentage of calories declined over the periods, total grams of fat increased for preschoolers and adolescent males.

Subgroups of these major food categories were examined in some analyses in order to provide more detailed information for nutrition educators. For example, the Food Guide Pyramid recommends that Americans consume 6 to 11 servings of grains daily; however, certain groups are higher in fat than others are. By examining high-fat grain products, we can offer indepth advice about the types of grain products that children should be encouraged to consume.

It is important to see changes in calories and fats consumed from these food categories, as well as changes in quantity (grams) consumed. Thus, changes can be detected in the types of food consumed within the food category, such as foods higher in caloric density and/or higher in fat. For example, in the grain category, we need to determine if higher fat grain products were consumed, then we can offer advice on choosing lower fat grain products. From the five major food categories, dairy products, grains, and the ''other'' category were examined further because the largest changes in amount (grams) consumed occurred here. In the grain group, grain mixtures and grain snacks were the primary focus. In the ''other'' category, beverages— particularly soft drinks—were the major focus.

Descriptive statistics for this study were derived using the SPSS statistical software package *(10)*. Significance tests were not performed—the 1989-91 CSFII was not meant to be combined with the 1994-95 CSFII, and sample weights are not appropriate for use with combined data.

Results

Household and Respondent Characteristics

Compared with 1994-95, slightly more children in the 1989-91 survey came from households with a lower income, and fewer children came from households that received food stamps (table 1). Household income as a percentage of the poverty thresholds was similar. Twenty-nine percent of children lived in households with a before-tax income of $19,999 or less in 1989-91, compared with 26 percent in 1994-95. Only 26 percent of children were from a household with a before-tax household income of $50,000 in 1989-91, compared with 37 percent in 1994-95. Twenty-five to 27 percent of the children were from a household with income that was 0 to 130 percent of the poverty thresholds. More children, however, came from households with an income of 131 to 350 percent of the poverty thresholds in 1989-91 than did so in 1994-95 (47 and 44 percent, respectively). Thirteen percent of children came from households that received food stamps in 1989-91, compared with 19 percent in 1994-95.

The average age of respondents was 9 years for both 1989-91 and 1994-95. Compared with 1994-95, in 1989-91, there were more children 6- to 11-years-old and fewer children 12- to 17-years-old. The percentage of males and females (51 and 49 percent, respectively), were about the same and consistent over the periods. There were fewer non-whites in the 1989-91 sample than in the 1994-95 sample (22 and 28 percent, respectively). In both surveys, a higher percentage of respondents lived in the South than in other regions, and the lowest percentage

Table 1. Characteristics of respondents, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Characteristics	1989-91[2]	1994-95[3]
Average age	9	9
	Percent	
Household		
Before-tax household income		
Less than $10,000	12	11
$10,000 - $19,999	17	15
$20,000 - $29,999	15	13
$30,000 - $39,999	15	13
$40,000 - $49,999	15	11
$50,000 and over	26	37
Household income as a percent of poverty thresholds		
0 - 130	25	27
131 - 350	47	44
Over 350	28	29
Households receiving food stamps	13	19
Respondent		
Age of children (years)		
2 - 5	27	27
6 - 11	40	37
12 - 17	33	36
Gender		
Male	51	51
Female	49	49
Race		
White	78	72
Non-White	22	28
Region of residence		
Northeast	19	19
Midwest	25	24
South	35	34
West	21	23
Urbanization		
Central city	29	31
Suburban	47	48
Nonmetropolitan	24	21

[1] Weighted data.
[2] n = 3,834, unweighted data.
[3] n = 3,318, unweighted data.

of respondents lived in the Northeast (19 percent). Over the two periods, the percentages remained relatively stable, and for both periods the highest percentage of respondents were from suburban areas, and the lowest percentage were from nonmetropolitan areas.

Fat Intakes

Fat intakes as a percentage of calories declined for all children over the periods, from 34 percent of calories to 33 percent of calories (fig. 1). Fat intakes as a percentage of calories also declined for all subgroups. The largest declines occurred for adolescents, with fat intakes as a percentage of calories for females declining from 34 to 32 percent and for males, 35 to 33 percent.

These results indicate that children are moving closer to recommendations in the *Dietary Guidelines for Americans* and the *Healthy People 2000 National Health Promotion and Disease Prevention Objectives,*[2] which call for reducing dietary fat intake to an average of 30 percent of energy or less among people age 2 years and older *(19).* However, while fat intakes as a percentage of calories declined over the periods, total grams of fat increased for preschoolers and adolescent males (fig. 2). On average, compared with other children, adolescent males had the highest level of fat intakes, 99 grams in 1994-95 and 95 grams in 1989-91. Preschoolers increased their consumption of total grams of fat: from 53 grams in 1989-91 to 55 grams in 1994-95. Gram consumption of fat remained stable for primary school children (71 grams). Unlike other subgroups, female adolescents experienced a decline in total grams of fat, from 70 grams in 1989-91 to 68 grams in 1994-95.

[2] Objective 2.5: Reduce dietary fat intake to an average of 30 percent of energy or less and average saturated fat intake to less than 10 percent of energy among people age 2 and older.

Energy Intakes

Considering caloric intake when examining changes in fat intakes as a percentage of calories provides a broader picture of the diet. Data show that caloric intake increased for all groups, especially for male adolescents, whose intake increased from 2,425 calories in 1989-91 to 2,698 calories in 1994-95 (fig. 3). Changes in caloric intake may be affected by revisions in the survey between the two periods. The 24-hour recall was revised in 1994 to include more probing questions and more exact measurement. This may have resulted in more complete reporting. However, USDA food supply data *(1),* which are based on disappearance data rather than self-reported data, also show an increase in food energy for each person each day from 3,500 calories in 1989 to 3,800 calories in 1994. Data collection methods did not change for food supply data over these years.

The National Research Council's Recommended Energy Allowances (REA) for 1989 were 1,300, 1,800, and 2,000 calories for children aged 1 to 3, 4 to 6, and 7 to 10, respectively, at light to moderate activity levels *(5).* For males aged 11 to 14 and 15 to 18, the recommendations average 2,500 and 3,000 calories, whereas for females aged 11 to 18, the recommended average is 2,200 calories. The energy intakes of all age/gender groups studied in this research, therefore, were within the recommended ranges.
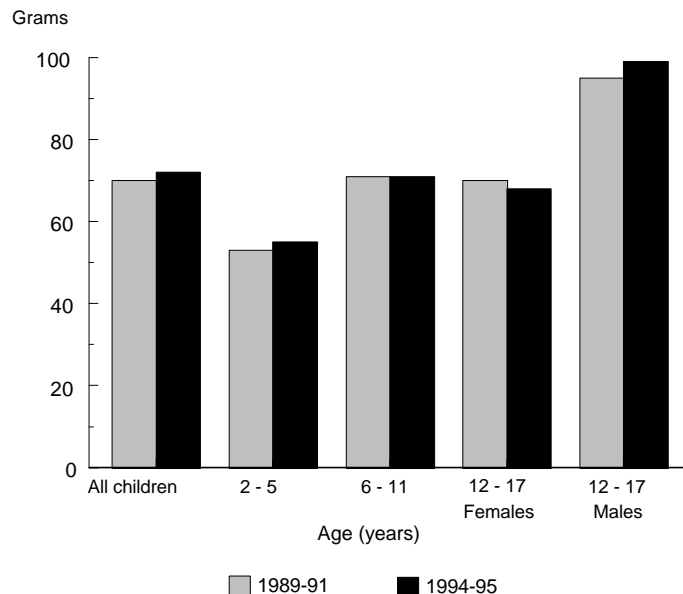
Carbohydrate Intakes

Consumption of carbohydrates increased for all age groups between the 1989-91 and 1994-95 surveys. The largest increase—309 to 366 grams—occurred for adolescent males (fig. 4). This change has contributed to a lower percentage of calories from fat in the diets of adolescent males and an increased percentage

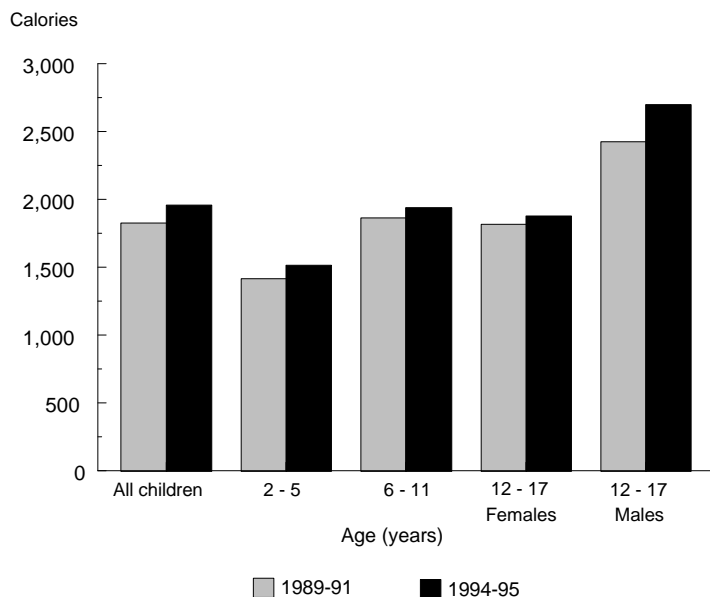**Figure 1. Fat intakes as a percent of total calories for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]**
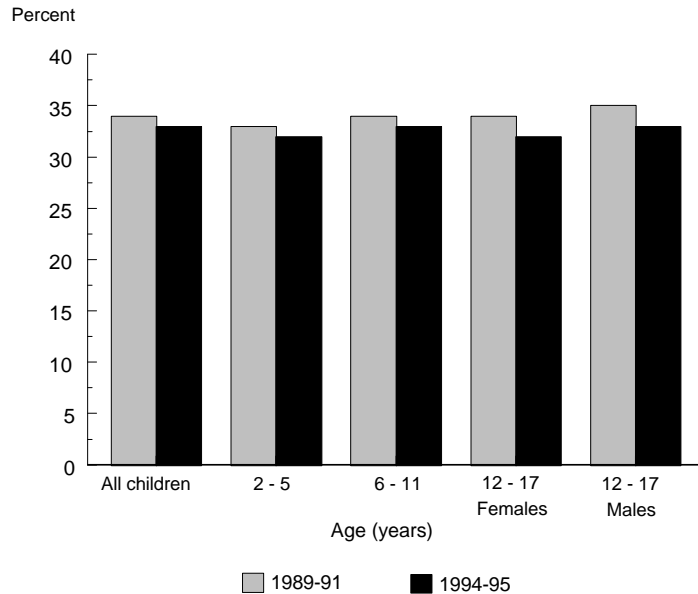
[1]Weighted data.

Figure 2. Total grams of fat consumed by children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]
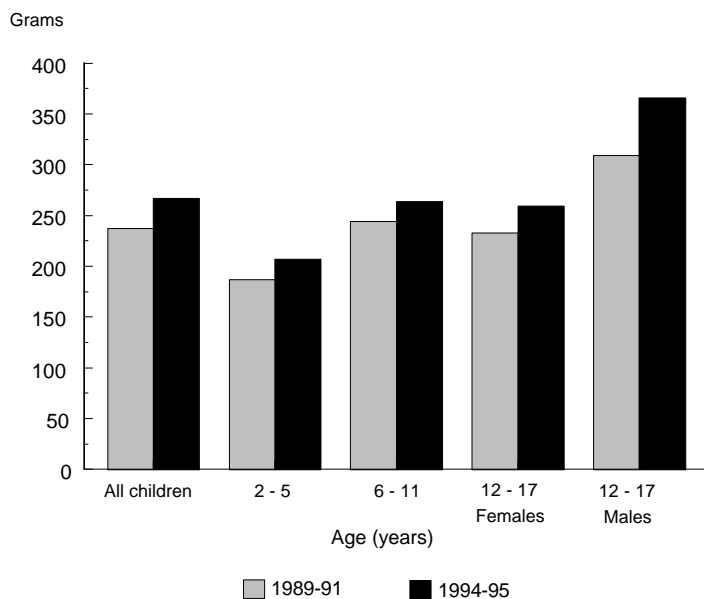

[1]Weighted data.

Figure 3. Changes in total caloric intake for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Calories

[1]Weighted data.

Figure 4. Carbohydrate intake (grams) for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Grams

[1]Weighted data.

of calories from carbohydrates. The National Research Council *(4)* recommends a diet with a carbohydrate intake of more than 55 percent of calories. In 1994-95, the carbohydrate intake for adolescent males was 54 percent of caloric intake; hence, their intake was near the recommended range. In 1989-91, carbohydrate intake as a percentage of calories for males was 51 percent, so a change did occur in percentage of calories from carbohydrates for this subgroup. Carbohydrate intake as a percentage of calories was also up for the other subgroups; however, each subgroup was at or below 55 percent of calories from carbohydrates (data not shown).

Food Intake and Fat Obtained From Major Food Sources

Over the periods, calories and carbohydrates were up, and fat as a percentage of calories was down for children aged 2 to 17. Examining changes in food consumption provides a better understanding of the reasons for those changes. Grams of meat consumed and fat obtained from meat remained relatively stable over the periods as did total grams and grams of fat from visible fats and oils (table 2). All four age/gender groups of the 2- to 17-year-olds were examined. Because consumption patterns were similar across groups, food group intake data are not shown.

Dairy Product Consumption

Overall, mean consumption of milk and milk products declined from 422 to 396 grams between 1989-91 and 1994-95. Also declining were mean calories (309 to 296 calories), mean fat intake in grams (15 to 14 grams), and fat as a percentage of calories (44 to 42 percent). Whole milk consumption declined, lowfat milk consumption remained stable, and skim milk consumption and other dairy (e.g., cheese, ice cream bars, and puddings) consumption rose (fig. 5).

Table 2. Food intake (grams) and fat obtained from major food sources for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Food group	1989-91				1994-95			
	Grams	Kcal	Fat	Fat % Kcal	Grams	Kcal	Fat	Fat % Kcal
Dairy	422	309	15	44	396	296	14	42
Meat	144	311	18	52	149	308	18	52
Grains	279	653	19	27	297	731	23	28
Fats/oils	8	46	5	97	7	38	4	95
Other[2]	715	509	13	23	876	584	13	21

[1]Weighted data.
[2]Includes eggs and egg mixtures; nuts and seeds; legumes; fruits, including fruit juices; fruit juice bars, and sorbets; vegetables, including potato chips; sugars; syrups; candies, popsicles, chewing gum; and beverages, including soft drinks.

Table 3. Food intake (grams) and fat obtained from grains for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Food group	1989-91				1994-95			
	Grams	Kcal	Fat	Fat % Kcal	Grams	Kcal	Fat	Fat % Kcal
Regular grains[2]	149	357	7	17	140	375	8	19
Cakes and cookies	30	113	5	38	34	133	6	37
Grain mixtures[3]	97	167	7	39	117	199	8	38
Grain snacks[4]	4	16	1	34	5	22	1	34

[1]Weighted data.
[2]Includes flour and dry mixes, yeast breads, quick breads, pancakes and waffles, pastas and cooked cereals, and not-cooked cereals.
[3]Includes Mexican dishes, pizza, other dough dishes such as oriental and Puerto Rican mixtures, pasta, grain dishes, and grain-based soups.
[4]Includes salty snacks from grain products such as crackers, rice cakes, popcorn, corn and tortilla chips, pretzels, and bagel chips.

Grain Consumption

Grain consumption rose from 279 grams in 1989-91 to 297 grams in 1994-95. From this food source, caloric intake rose from 653 to 731 calories; fat grams, from 19 to 23 grams; and fat as a percentage of calories, from 27 to 28 percent. For this paper, we focused on grain mixtures and grain snacks because of their popularity with children.

Grain mixtures
Consumption of grain mixtures increased greatly—from 97 to 117 grams—over the periods (table 3). Calories obtained from grain mixtures also increased. Fat obtained from grain mixtures increased slightly, and fat as a percentage of calories declined slightly.

Mean intake for all grain mixtures increased (fig. 6). The largest increases occurred for the pasta dishes, grain-based soups, and Mexican foods. Pizza, grain dishes, and other dough (Asian and Puerto Rican mixtures, turnovers, and croissants) also increased. Children consumed pasta in the largest quantity (grams).
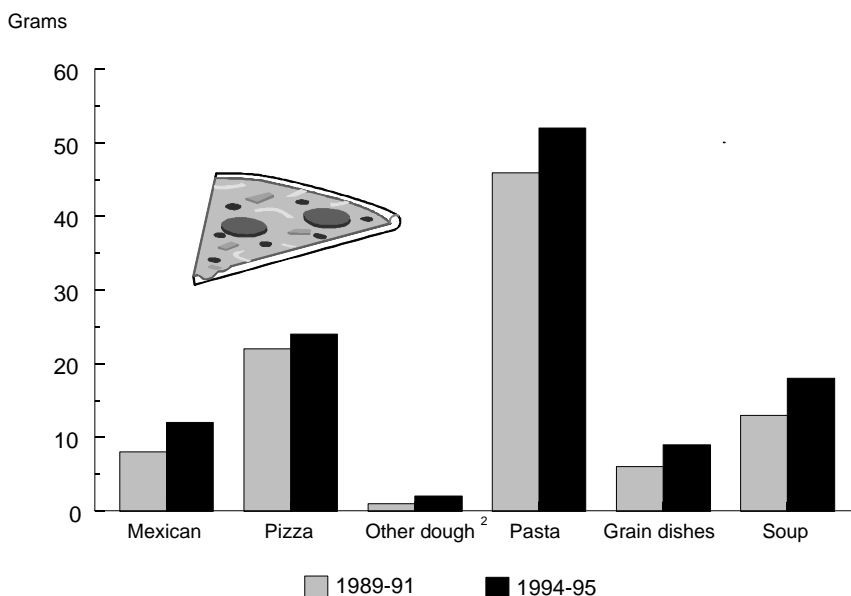
Figure 5. Dairy product intake (grams), by type consumed for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]
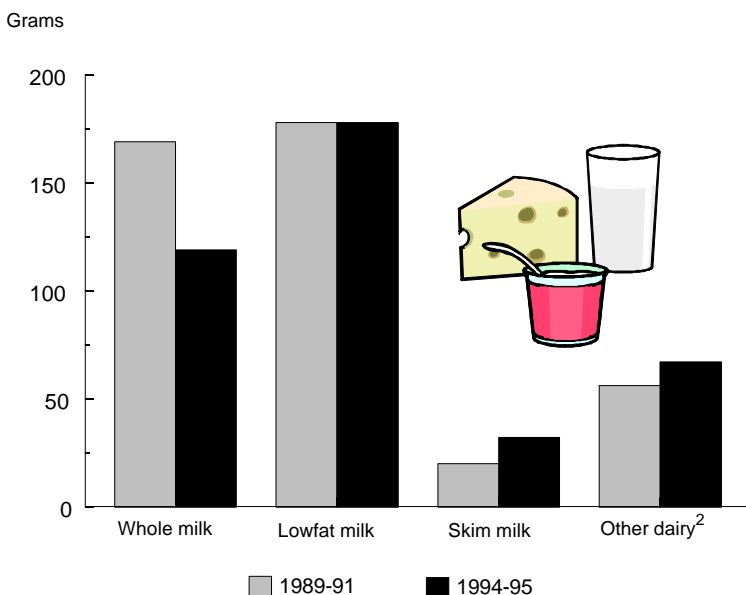
[1]Weighted data.
[2]Other dairy includes products such as cheese, ice cream bars, and puddings.

Figure 6. Grain mixture intake (grams) for children aged 2-17, by type of grain mixture, CSFII 1989-91 versus 1994-95, 1-day data set[1]

[1]Weighted data.
[2]Other dough includes Asian and Puerto Rican mixtures, turnovers, and croissants.

Mean percentage of calories from fat decreased for some grain mixtures: Mexican, pizza, and pasta (fig. 7). The percentage of calories from fat from ''other dough'' grain mixtures increased greatly—from 35 percent in 1989-91 to 55 percent in 1994-95—and formed the main source of calories from fat for the grain mixture category. Fat as a percentage of calories from grain-based soups also increased sharply: from 13 to 34 percent.

Grain snacks
Grain snacks includes salty snacks from grain products such as crackers, rice cakes, popcorn, corn and tortilla chips, pretzels, and bagel chips. Mean intake of grain snacks in grams and caloric intake from this food source increased slightly for all children between 1989-91 and 1994-95 (table 3). Fat and fat as a percentage of calories remained stable. Intake of grain snacks increased for all subgroups. Adolescent males had the largest increase, from 2 to 5 grams, followed by adolescent females, from 3 to 5 grams. Intake for the other sub-groups increased from 4 to 5 grams (data not shown). Mean percentage of calories from fat for grain snacks increased for primary school children from 30 to 35 percent and for adolescent males from 32 to 33 percent; it remained stable for the other age/gender groups (data not shown).

Children's increased intake of grain products is consistent with current recommendations. The *Food Guide Pyramid (17)* recommends 6 to 11 grain servings each day, depending on caloric intake. Grain products that are made with little fat or sugars are recommended. However, the grain snacks that children chose in 1994-95 were not lower in fat than the grain snacks they chose in 1989-91.

## Consumption of Foods in the "Other" Category

For the "other" food category, major changes occurred. In 1989-91, children consumed 715 grams of "other" food, compared with 876 grams in 1994-95 (table 2). This category provided fewer calories for children in 1989-91 than it did in 1994-95. Fat remained stable at 13 grams, and fat as a percentage of calories declined, moving from 23 percent in 1989-91 to 21 percent in 1994-95.

Major changes occurred with beverages (fig. 8). Beverage consumption increased for all types: Coffee, tea, breakfast drinks, soft drinks, fruitades and drinks, non-fruit beverages, noncarbonated beverages without vitamin C made from powdered mixes, and unreconstituted dry-beverage concentrates. The largest increase occurred for the soft drink category (including carbonated water and carbonated juice drinks), which increased from 198 grams in 1989-91 to 279 grams in 1994-95. Compared with their consumption of other beverages, male adolescents increased their consumption of soft drinks (fig. 9). Their consumption of soft drinks rose from a mean intake of 352 grams in 1989-91 to 580 grams in 1994-95. Increased soft drink consumption was a contributor to increased carbohydrate consumption, especially among adolescent males. The average soft drink has 9 teaspoons of sugar for a 12-ounce container.

Nutrient Intakes

Appreciable changes in nutrient intakes did not occur between the two periods (table 4). However, slight changes did occur for certain nutrients. All children 2 to 17 years old, as well as all subgroups, increased their iron intake. Female adolescents increased their iron intake slightly, from 82 to 89 percent of the Recommended Daily Allowances
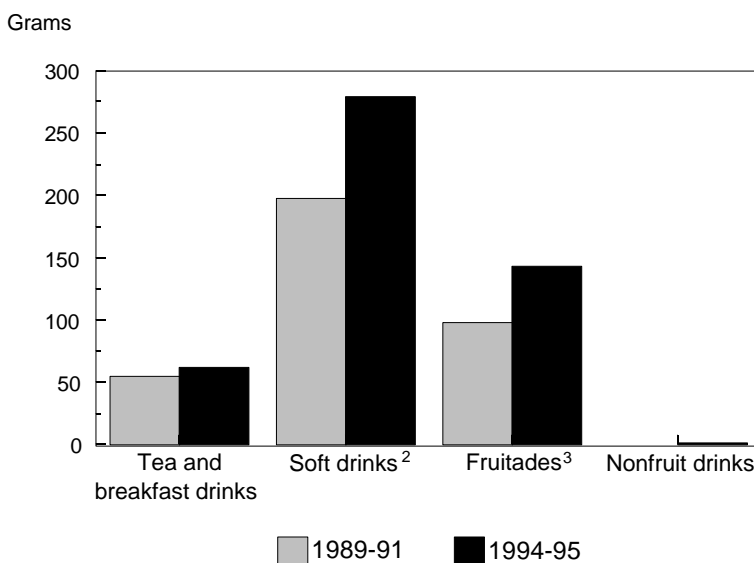
Figure 7. Percent of calories from fat for grain mixtures consumed by children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]
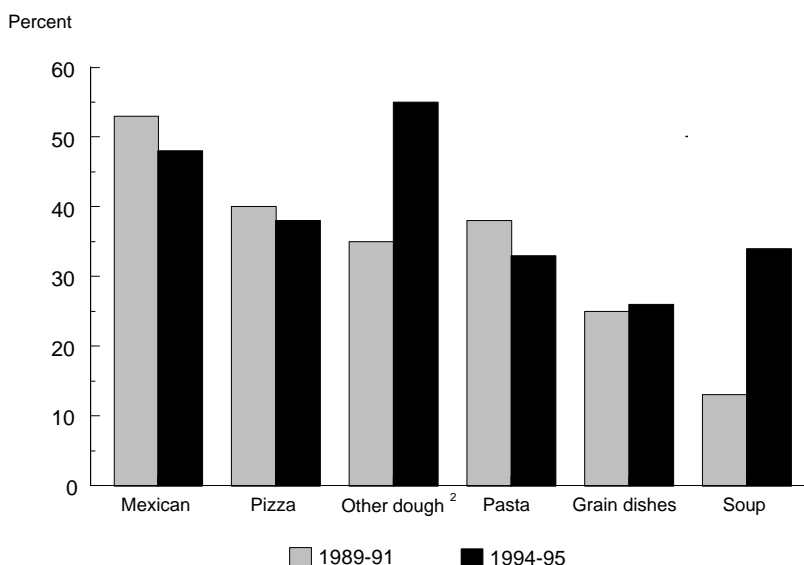
[1]Weighted data.
[2]Other dough includes Asian and Puerto Rican mixtures, turnovers, and croissants.

Figure 8. Beverage intake (grams), by type consumed for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]
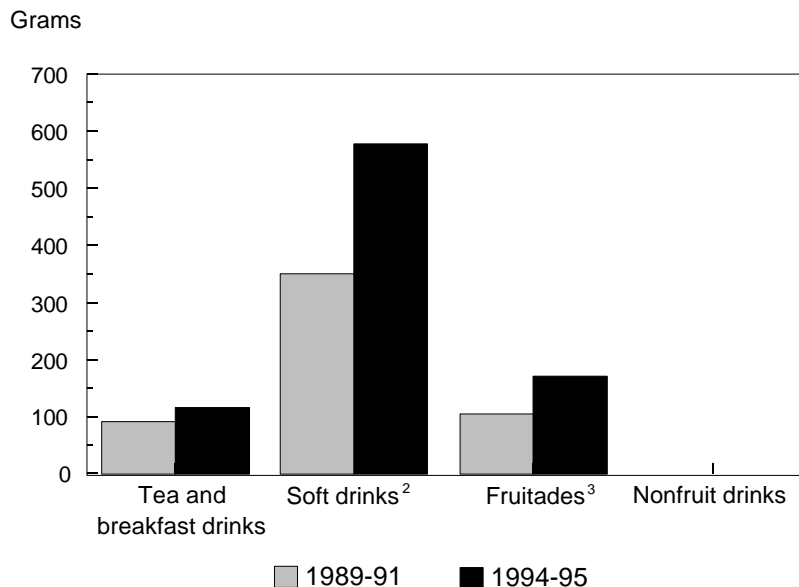

[1]Weighted data.
[2]Soft drinks includes carbonated water and carbonated juice drinks.
[3]Fruitades includes fruitades and drinks----low calorie and regular, ready to drink, from concentrate and powder.

Figure 9. Beverage intake (grams), by type consumed for males aged 12-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Grams

| 1989-91 | 1994-95 |

[1]Weighted data.
[2]Soft drinks includes carbonated water and carbonated juice drinks.
[3]Fruitades includes fruitades and drinks---low calorie and regular, ready to drink, and concentrate and powder.

The largest increase occurred for the soft drink category (including carbonated water and carbonated juice drinks), which increased from 198 grams in 1989-91 to 279 grams in 1994-95.

(RDAs). The increase in iron intake may be related to the increased intake of grain products, which are frequently iron-fortified.

New Dietary Reference Intakes for calcium were released by the National Academy of Sciences in 1997 to replace the RDAs *(6)*. These new guidelines set standards for adequate intakes (AI's) as well as for tolerable upper limits of intakes. The new AI's call for consumption of 500 milligrams (mg) of calcium per day for children aged 1 to 3, 800 mg for children aged 4 to 8, and 1,300 mg per day for children aged 9 to 18. One 8-ounce glass of skim milk equals about 300 mg of calcium.

Previous RDAs advised an intake of 800 mg per day for children aged 1 to 10 and 1,200 mg for both genders aged 11 to 24 *(5)*. Puberty, and particularly early puberty, has been identified as an important time for bone formation in which calcium intake plays a major role.

The mean intake of calcium, based on the AI measure, was 99 and 96 percent in 1989-91 and 1994-95, respectively. Children aged 2 to 5 had a higher mean intake as a percentage of the AI than any other age group had. This figure seems high, compared with those in previous reports of this group's intake as a percentage of the 1989 calcium RDA because the AI for children aged 2 to 3 is 300 mg lower than the 1989 RDA.

Table 4. Percent of Recommended Dietary Allowances for children aged 2-17, CSFII 1989-91 versus 1994-95, 1-day data set[1]

Nutrient	1989-91					1994-95				
	All	2-5 years	6-11 years	Females 12-17 years	Males 12-17 years	All	2-5 years	6-11 years	Females 12-17 years	Males 12-17 years
					Percent					
Protein	222	275	235	151	177	218	277	230	144	180
Zinc	86	74	94	80	90	90	83	99	81	93
Magnesium	137	199	137	78	92	136	202	138	77	94
Iron	118	108	128	82	148	131	120	143	89	164
Phosphorus	129	125	145	96	132	128	125	144	93	135
Thiamin	148	154	154	129	143	154	163	162	126	151
Riboflavin	165	183	170	134	154	168	188	174	135	158
Folate	252	351	259	143	184	248	345	261	138	188
Vitamin B_6	115	125	118	100	108	122	136	123	104	119
Vitamin B_{12}	324	438	315	188	295	311	407	311	198	282
Vitamin C	200	200	206	176	209	219	233	226	180	222
Vitamin A	145	182	149	109	111	148	195	142	118	120
Vitamin E	85	74	92	83	87	89	81	94	83	94
Calcium[2]	99	132	95	63	89	96	129	92	61	90

[1]Weighted data.
[2]Adequate intake recommendations rather than recommended dietary allowances were used.

At both periods, adolescent females had particularly low intakes. Their mean calcium intake was 61 percent of the AI in 1994-95, down from 63 percent in 1989-91. Additionally, female teens continued to have mean intakes of zinc, magnesium, phosphorus, and vitamin E that were below 100 percent of the RDA. The shortcomings in the female adolescents' diets may be related to their eating patterns. Previous analysis found that compared with other children, female adolescents are more likely to skip morning meals that are high in calcium and iron, eat the smallest number of meals and snacks, have the largest proportion of meals and snacks away from home, and drink the least amount of fluid milk *(3)*.

Discussion and Conclusions

Results demonstrate the complexity of assessing dietary change in relation to current recommendations. Between 1989-91 and 1994-95, 2- to 17-year-olds reduced the percentage of calories obtained from fat. On the surface, this suggests that children are moving closer to the recommendations of the *1995 Dietary Guidelines for Americans* and the goals for fat consumption of *Healthy People 2000*. Although the percentage of calories from fat declined, actual fat intakes did not decrease. Only female adolescents reduced the total grams of fat obtained over the periods.

Caloric intake increased for children. However, survey methods changed between the two periods. The 24-hour recall was revised in 1994 to include more probing questions and more exact measure, which may have resulted in more complete reporting. Changes in caloric intake could be affected by this. Carbohydrate intake, mainly from grain mixtures and beverages, (particularly soft drinks) rose over the periods, and percentage of calories from carbohydrates increased.

Increased consumption of soft drinks is a concern because soft drinks may contribute excess calories or displace more nutritious foods from the diet. As soft

drink consumption rose, consumption of dairy products declined slightly. Consumption of skim milk and other dairy products increased; whereas, consumption of whole milk declined. This change in the type of milk consumed has helped children achieve a lower percentage of calories from fat. If total dairy products continue to decline, however, it is unlikely that improvement in calcium intakes will occur.

Previous research has indicated that soft drinks can displace milk in children's diets, with negative consequences for total diet quality *(2)*. Although children ate more calories in 1994-95 than they did in 1989-91, nutrient intakes (except for iron) were not notably higher, and calcium intakes were lower. This finding is consistent with another finding—additional calories were largely obtained from soft drinks, which do not add nutrients to the diet.

Per capita food consumption data *(9)* released by USDA's Economic Research Service (ERS) confirm the increase in soda consumption found in this study. ERS data show that consumption of carbonated soft drinks rose from 45.4 to 52.2 gallons per year from 1989 to 1994, respectively. In the carbonated soft drink category, diet soda consumption rose from 10.7 to 11.9 gallons per year; whereas, regular soda consumption rose from 34.7 to 40.3 gallons per year. These data indicate that the increase in beverage intake between 1989-91 and 1994-95 actually occurred and was not due solely to the change in the 24-hour recall method.

The increased consumption of carbohydrates contributed to a lower percentage of calories from fat. It appears, however,

that fat in the diet was largely diluted by refined carbohydrates, such as the sweeteners in sodas, rather than replaced by complex carbohydrates, as recommended by the National Research Council *(4)* and the *1995 Dietary Guidelines for Americans*. It would be useful to conduct further research, such as multivariate analysis, that explored factors contributing to these changes.

Our findings regarding increased carbohydrate intake are consistent with those of the Bogalusa Heart Study *(8)*, which has been collecting data on children's dietary intakes for more than 20 years. The Bogalusa study found that although total energy intakes remained the same from 1973 to 1988, the composition of macronutrients shifted: the percentage of energy from protein and carbohydrates increased and the percentage of energy from total fat, particularly saturated fat, decreased *(7)*.

The Bogalusa Heart Study *(8)* also found that when children were grouped on the basis of fat intake, the low-fat intake group consumed 25 percent less calories than did the high-fat intake group, and the percentage of calories from sugar was greater for the low-fat intake group, compared with their counterparts. A high percentage of total sugar intake in the low- and high-fat intake groups came from beverages, 25 to 19 percent, respectively *(8)*. Less nutrient-dense food, such as soft drinks, are major contributors to energy and carbohydrates and may substitute for intake of more nutritious foods *(11)*. Although these less nutrient-dense foods contribute to the decline in percentage of calories from fat, they are not in keeping with dietary guidance and may displace more nutrient-dense foods such as juice or milk.

Grain consumption increased, indicating progress toward meeting the 1995 Dietary Guidelines Advisory Committee's recommendation to consumers to ''make grains the center of your plate'' *(15)*. Grain mixture intake (grams) increased for all types of grain mixtures studied, and grain snack intake increased for all age/gender groups. However, the grain products that children chose in 1994-95 were not lower in fat than the grain products they chose in 1989-91. Nutrition promotion messages and strategies encouraging children to choose lower fat grain products could be helpful. Food supply interventions, such as the design and marketing of lower fat versions of grain products that are popular with children, could also be used.

Children's nutrient intakes did not change remarkably over the periods. All age/gender groups increased their iron intake slightly. Female adolescents continued to have a calcium intake that is far below recommendations—clearly this issue needs attention. Also, female adolescents continued to have average intakes of several other nutrients that are below recommendations.

This study demonstrates how important it is that nutrition promotion messages and strategies directed toward children emphasize total diet quality. A well-chosen, low-fat diet that provides carbohydrates primarily from low-fat grains, vegetables, and fruits provides generous amounts of essential nutrients and fiber. A diet that is low in fat as a percentage of calories because of high intakes of soft drinks does not provide the same benefits. Messages and strategies—such as those based on the *Food Guide Pyramid*—are needed to promote total diet quality *(17)*. Also needed are dietary evaluation tools such as the *Healthy Eating Index (16)* that assess total diet quality.

The dietary concerns of specific age/gender groups of children may vary, and guidance specifically tailored to these groups may be needed. Adolescent males, for example, had the largest increase in soda consumption of any group and may benefit especially from guidance on avoiding overconsumption of low nutrient-dense foods. Efforts to increase intake of essential nutrients, particularly calcium, should be targeted toward female adolescents.

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Insight 5

Is Total Fat Consumption Really Decreasing?

Rajen S. Anand
P. Peter Basiotis

Introduction

The linkage between poor diet and various diseases has been well documented. A major contributor to many diet-related diseases is the overconsumption of fat. In particular, the type and quantity of dietary fat are risk factors for the development of coronary heart disease and some types of cancer. It is estimated that diet-related diseases cost society over $250 billion annually in medical expenses and lost productivity *(1)*.

Recognizing the importance of a healthful diet, the U.S. Government formulates dietary guidance and maintains a nutrition monitoring system to assess healthfulness of the diet of Americans. For over a century, USDA has provided

dietary guidance to the public. Since 1980, the Government has produced dietary recommendations called *Dietary Guidelines for Americans* issued jointly by the U.S. Departments of Agriculture and Health and Human Services.

Government Recommends Limit on Fat Intake

Since their inception, the *Dietary Guidelines* have recommended that Americans 2 years and over choose a diet moderate in fat, saturated fat, and cholesterol. The 1990 *Dietary Guidelines* were the first to set numerical goals: total fat consumption should be limited to 30 percent or less of total caloric intake, and saturated fat intake should be limited to less than 10 percent of total caloric intake.

Figure 1. Percent of calories from total fat, individuals 19 to 50 years of age
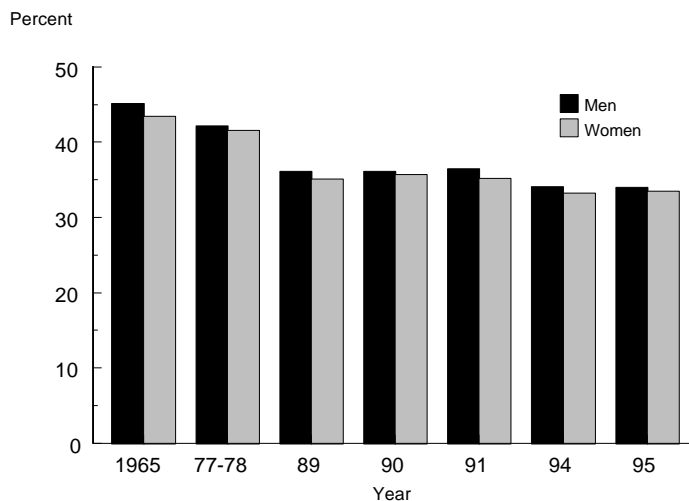
In addition to reducing the risk for chronic diseases, a diet low in total fat makes it easier to consume the variety of foods, such as fruits and vegetables, needed to provide essential nutrients without exceeding caloric needs. The 1995 Dietary Guidelines Advisory Committee, a group composed of independent experts in the fields of nutrition, dietetics, and health, retained the numeric goals for fat set in 1990.

Relative Fat Consumption Continues to Decline; Total Fat Consumption Does Not

Figure 1 shows that adult Americans have dramatically lowered the percent of caloric intake from total fat over the last three decades. The reduction is from about 45 percent of calories from fat in 1965 to about 34 percent in 1995.

The table shows that daily fat consumption, measured in grams, by men 19 to 50 years of age also declined from 139 gm/day in 1965 to 89 gm/day in 1990. However, it increased to 101 gm/day in 1995. The largest increase (not shown), 33 percent, was seen in 31- to 40-year-old men who consumed a daily average of 109 gm of fat in 1995, compared with 82 gm in 1990. Women 19 to 50 years old decreased their fat intake from 83 gm/day in 1965 to 62 gm/day in 1989 and maintained their fat consumption almost at the same level thereafter.

Summarizing, fat consumption in both men and women decreased between 1965 and 1990. The percent of calories from fat continued to decrease between 1990 and 1995 even as the daily grams of fat intake remained steady or increased.

**Average total fat consumption, individuals 19 to 50 years of age**

Years	Men	Women
	--- Grams per day---	
1965	139	83
1977-78	113	73
1989	96	62
1990	89	64
1991	100	62
1994	101	62
1995	101	65

The explanation for this apparent paradox is that although daily fat consumption was increasing or remaining unchanged, the total caloric intake was increasing at a relatively faster pace (figs. 2 and 3). For example, there was a 13-percent increase in fat consumption among men 19 to 50 years old between 1990 and 1995, but a 21-percent increase in total caloric intake over the same period. A higher number of calories consumed will reduce the calculated percentage of calories from fat even when there is no decrease in total fat consumption.

The recent increase in caloric intake comes largely from increased carbohydrate consumption, and to a lesser extent, increased alcohol consumption. Analysis of food consumption data by the Center for Nutrition Policy and Promotion reveals that increased consumption of grain products, certain soft drinks, and alcoholic beverages has contributed to the overall reported increase in caloric intake *(2)*.

The percent of calories from fat continued to decrease between 1990 and 1995 even as the daily grams of fat intake remained steady or increased.

Figure 2. Contribution to total caloric intake: Men 19 to 50 years of age

Kilocalories
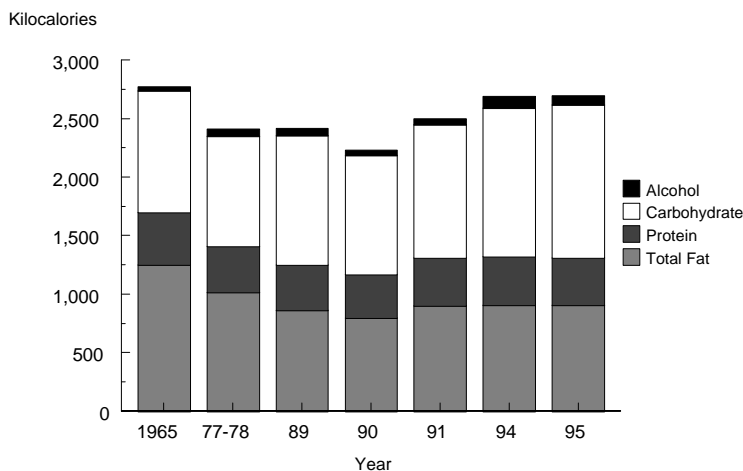
Total caloric intake, as well as calories from fat, decreased between 1965 and 1990. Total caloric intake began to increase relatively more than the increase in calories from fat between 1991 and 1995.

Figure 3. Contribution to total caloric intake: Women 19 to 50 years of age

Kilocalories
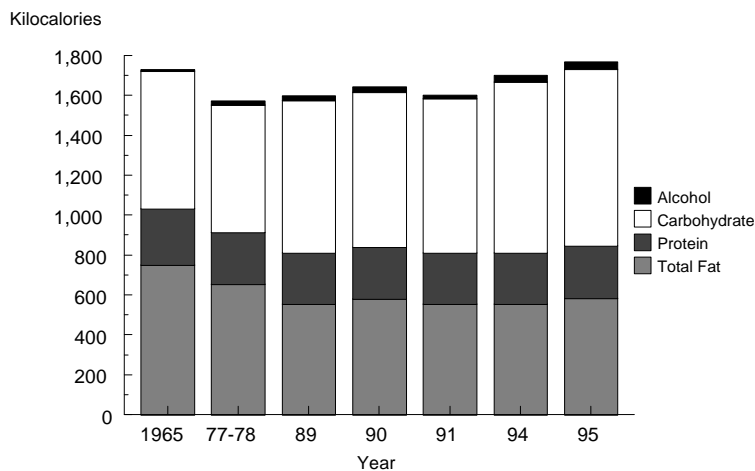
Total caloric intake, as well as calories from fat, decreased between 1965 and 1989. Total caloric intake increased between 1990 and 1995, whereas calories for fat consumption remained at a steady level.

Source: U.S. Department of Agriculture, 1965 and 1977-78 Nationwide Food Consumption Surveys, and 1989-91 and 1994-95 Continuing Survey of Food Intakes by Individuals.

Conclusion

Total fat consumption expressed as a percent of caloric intake has steadily decreased since 1965. However, in the past 5 years, the decrease in percent of calories from fat is a result of increased total caloric intake and not necessarily due to decreased fat consumption. The daily fat intake in grams has, in fact, increased in many cases, reversing the trend of Americans consuming less fat in their diet as was reported earlier *(3)*.

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Report Card on the Diet Quality of African Americans

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The Healthy Eating Index (HEI), computed on a regular basis by the U.S. Department of Agriculture (USDA), is a summary measure of people's overall diet quality. The most recent HEI report found that Americans' diet quality varies by demographic and socioeconomic characteristics. Of the various population subgroups, African Americans have a diet of particularly poor quality. This *Nutrition Insight* examines the diet of African Americans in more depth. Data used are from USDA's 1994-96 Continuing Survey of Food Intakes by Individuals, a nationally representative survey containing information on food consumption and nutrient intake.

Healthy Eating Index

The Healthy Eating Index consists of 10 components, each representing different aspects of a healthful diet:

- Components 1-5 measure the degree to which a person's diet conforms to the USDA's Food Guide Pyramid serving recommendations for the five major food groups: Grains (bread, cereal, rice, and pasta), vegetables, fruits, milk (milk, yogurt, and cheese), and meat (meat, poultry, fish, dry beans, eggs, and nuts).

- Component 6 measures total fat consumption as a percentage of total food energy (calorie) intake.

- Component 7 measures saturated fat consumption as a percentage of total food energy intake.

- Component 8 measures total cholesterol intake.

- Component 9 measures total sodium intake.

- Component 10 measures variety in a person's diet.

Each component of the Index has a maximum score of 10 and a minimum score of zero. Intermediate scores are computed proportionately. High component scores indicate intakes close to recommended ranges or amounts; low component scores indicate less compliance with recommended ranges or amounts. The maximum overall score for the 10 components combined is 100. An HEI score above 80 implies a "good" diet, an HEI score between 51 and 80 implies a diet that "needs improvement," and an HEI score less than 51 implies a "poor" diet.

Healthy Eating Index Score for African Americans

The mean HEI score for African Americans is 59, compared with 64 for Whites and 65 for the Other racial group (Asian/Pacific Islander Americans, American Indians, and Alaskan Natives). Only 5 percent of African Americans, compared with 11 percent of Whites,
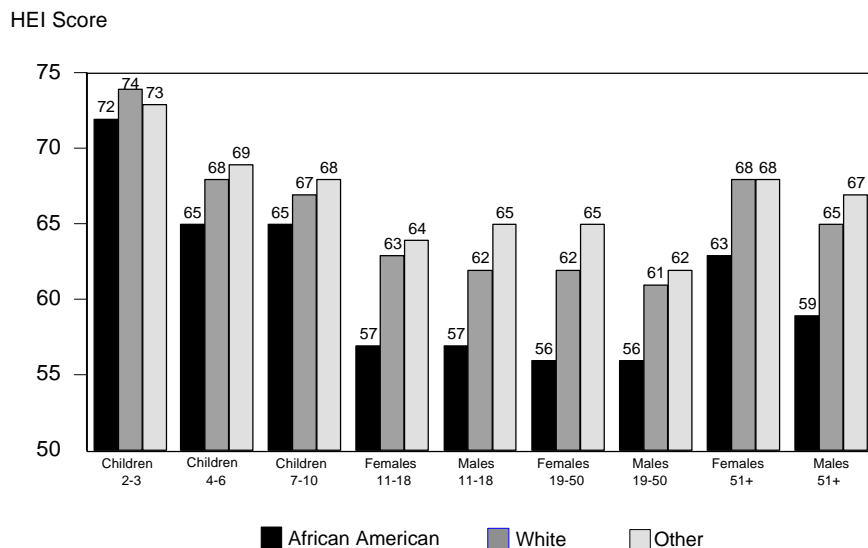
Figure 1. Healthy Eating Index Rating by Race

Figure 2. Healthy Eating Index Scores by Race, Age/Gender Subgroups
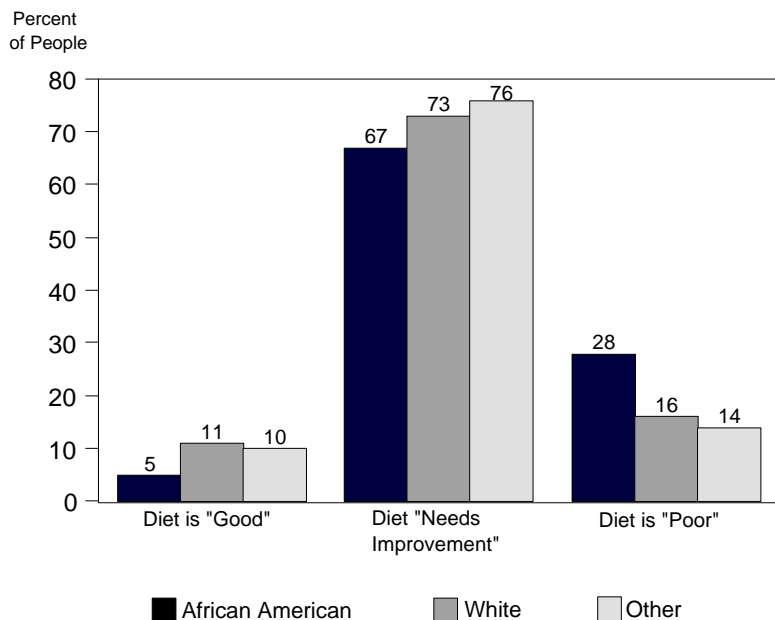
have a good diet (fig. 1). Twenty-eight percent of African Americans have a poor diet, compared with 16 percent of Whites and 14 percent of the Other racial group. Most people in all three groups have a diet that needs improvement.

African Americans do better on the cholesterol component of the HEI relative to the other components (table). Their cholesterol score averages 7.4 on a scale of zero to 10. Whites and the Other racial group also score well on the cholesterol component. This indicates that Americans in general are heeding the message of consuming a low cholesterol diet. The fruits component has the lowest mean score (3.5) for African Americans, and the milk component, the second lowest score (4.2). African Americans consume lower amounts of fruits and milk products than others do. Prevalence of lactose intolerance could be one reason why African Americans consume less of milk products than others. African Americans score lower than other groups on the total and saturated fat components of the Index; only 31 percent of African Americans meet the dietary recommendation for total fat.

Compared with Whites, African Americans have a lower average score on most HEI components—exceptions are the meat and sodium components. The higher sodium score (indicating lower sodium intake) may be related to the lower grain score for African Americans: many grain products are high in sodium. African Americans also have a lower average score on most HEI components, compared with the Other racial group. For 9 of the 10 HEI components, fewer than 50 percent of African Americans meet the dietary recommendations.

Healthy Eating Index: Overall and component mean scores for people, by race, 1994-96 (Percent of people meeting the dietary recommendations for each component in parentheses)

	African American	White	Other
Overall	59	64	65
Components			
Grains	6.1 (18)	6.7 (23)	6.9 (27)
Vegetables	5.7 (29)	6.3 (31)	6.2 (31)
Fruits	3.5 (16)	3.9 (17)	4.4 (21)
Milk	4.2 (15)	5.7 (27)	4.9 (23)
Meat	7.0 (35)	6.4 (27)	6.8 (34)
Total fat	6.2 (31)	6.8 (37)	7.4 (42)
Saturated fat	6.0 (35)	6.4 (40)	7.0 (47)
Cholesterol	7.4 (65)	8.0 (72)	7.3 (64)
Sodium	6.6 (39)	6.3 (34)	6.3 (38)
Variety	6.7 (38)	7.8 (54)	7.9 (57)

For milk, only 15 percent of African Americans meet the dietary recommendations on a given day; for fruits, 16 percent; and for grains, 18 percent. For cholesterol, 65 percent of African Americans meet the dietary recommendation.

Healthy Eating Index Score for African Americans by Age/gender

By age/gender subgroups, African Americans have lower overall HEI scores than do Whites and the Other racial group (fig. 2). The HEI score for African American children starts out slightly below the scores of children in the two other groups: this gap widens as they get older. African American children age 2 to 3 have an HEI score of 72, compared with 74 for Whites in this age group—a 3-percent difference. African American children age 11 to 18 have an HEI score of 57, compared with 62 (males) and 63 (females) for Whites in this age group—about a 10-percent difference.

African American females and males age 19 to 50 have the lowest HEI score (56) among all age/gender subgroups. Whites in this age group have average scores of 61 (males) and 62 (females). African American age 51 and over have higher HEI scores than do younger adult African Americans. The HEI scores of these older African Americans, however, are lower than the scores of Whites and the Other racial group age 51 and over.

Summary

Most Americans have a diet that needs improvement. African Americans are especially prone to having a less-than-ideal diet. This *Nutrition Insight* provides an awareness and better understanding of the types of dietary changes needed to improve the eating patterns of African Americans. Nutrition professionals may use these results in nutrition education and promotion activities to help improve the dietary habits of African Americans.

The 1998 Revision of the Consumer Price Index

The Consumer Price Index (CPI) is the principal source of information concerning trends in consumer prices and inflation in the United States and is one of the Nation's most important economic indicators. The measure is used by the private sector to adjust contract amounts and other payments among individuals and organizations. It is also used by the Federal Government to adjust payments to Social Security recipients, to Federal and military retirees, and for a number of entitlement programs such as food stamps and school lunches. An increase in the CPI increases Federal statutory obligations for these payments and programs. Individual income tax brackets and personal exemptions are adjusted for inflation using the CPI.[1]

The CPI is a measure of price change for a fixed market basket of goods and services of constant quantity and quality purchased for consumption. Consumers change their purchasing patterns in response to relative price changes, new product distribution patterns and marketing techniques, population and other demographic changes, and changes in consumer preferences. The CPI samples and weights are updated about every 10 years to reflect these changes and to maintain the Index as an accurate measure of current price inflation. The next revision in the market basket will

occur in January 1998; other elements in the revision are expected to be completed in 2000. Included will be the reselection and reclassification of areas, items, outlets, and the development of new systems for data collection and processing.

Numerous methodological improvements in the CPI have taken place both within and without the revision framework (table 1).

History of the CPI

The CPI was developed during World War I to help establish cost-of-living adjustments for workers in shipbuilding centers because prices were increasing so rapidly. Regular publication of a national index began in 1921, based on an expenditure pattern corresponding to the 1917-19 period. Since then, the Bureau of Labor Statistics (BLS) has updated (or revised) the CPI five times (table 2). Each revision, in addition to updating expenditure weights because people's buying patterns had changed substantially, brought important methodological innovations that improved the Index's accuracy and representativeness.

The 1998 Revision

Effective with publication of CPI data for January 1998, movements in the Index will be based on 1993-95 consumer expenditures. These data will be used to calculate new expenditure weights. The 1998 market baskets will reflect new geographic area samples, new item structure, new outlets in which items are priced, and new expenditure weights.

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[1]In fiscal year 1996, each 1-percent increase in the Index produced a $5.7 billion increase in outlays and a $2.5 billion decline in revenues.

Table 1. Improvements to the Consumer Price Index

Change	Date implemented	Description
New construction	1966	Rent samples augmented with units built after 1960.
Quality adjustment of new automobile prices	1967	New automobile prices adjusted for quality differences after model changeovers.
Sample rotation	1981	Introduced a systematic replacement of outlets between major revisions.
Rental equivalence	1983	Changed homeowners' component from cost of purchase to value of rental services for CPI-U.
Return from sale price imputation	1984	Introduced procedure to eliminate downward bias for items discontinued by outlets that went out of index with discounted prices.
Rental equivalence	1985	Changed CPI-W homeowners' component to value of services.
Enhanced seasonal products methodology	1987	Enhanced methodology used for seasonal items by expanding the number of price quotations to select products from alternate seasons and eliminate under-representation of such items.
Quality adjustment of used car prices	1987	Prices of used cars adjusted for differences in quality after model changeovers.
Aging bias correction	1988	Rental values adjusted for aging of the housing stock.
Imputation procedures for new cars and trucks	1989	Price changes for noncomparable new models are imputed using only the constant-quality price changes for comparable model changeovers.
Quality adjustment of apparel prices	1991	Regression models used to adjust apparel prices for changes in quality when new clothing lines are introduced and eliminate bias due to linking product substitutions into the CPI.
Discount air fares	1991	Substitution rules modified to expand pricing of discount airline fares.
Sample augmentation	1992	Increase in the number of outlets from which prices are collected to replace sample lost through sample attrition.
New models imputation	1992	Refined imputation methods used when introducing products into the CPI.
Hotels and motels	1992	Samples for hotels and motels quadrupled to reduce variances related to seasonal pricing.
Seasonal adjustment	1994	Procedures for seasonal adjustment revised to eliminate residual seasonality effects.
Quality adjustment for gasoline	1994	Treat ''reformulated'' gasoline as a quality change and adjust the price to reflect quality difference. Impact of the change estimated.
Generic drugs	1995	Introduced new procedures that allow generic drugs to be priced when a brand drug loses its patent.
Food-at-home base period prices	1995	Introduced seasoning procedures to eliminate upward bias in setting of base period prices of newly initiated items.
Rental equivalence	1995	Modified imputation of homeowners' implicit rent to estimate the upward drift property of the current estimator.
Composite estimator used in housing	1995	Replaced current composite estimator with a 6-month chain estimator. Under-reporting of 1-month rent changes had resulted in missing price change in residential rent and homeowners' equivalent rent. Old estimator also produced higher variances.
Commodities and services base period prices	1996	Extended food-at-home seasoning procedures to remainder of commodities and services series. Base period priced left unchanged in most noncomparable subsitutions.

Source: Greenlees, J.S. and Mason, C.C., 1996, Overview of the 1998 revision of the Consumer Price Index, Monthly Labor Review 119(12):3-9.

Table 2. Previous CPI revisions

Release of revised CPI	Expenditure base period	Notable innovations
1940	1934-36	Introduced the concept of a sample of cities and items, and the principle of imputation
1953	1950	Expanded population coverage to represent all urban wage earner and clerical worker families
1964	1960-61	Expanded population coverage to represent individuals as well as families; introduced computer processing
1978	1972-73	Expanded population coverage to represent all urban consumers; improved methodology for construction of outlet sample frame; introduced probability sampling techniques into the selection of the item and outlet samples
1987	1982-84	Expanded scope of systematic outlet rotation; introduced advanced sample allocation model

Source: Greenlees, J.S. and Mason, C.C., 1996, Overview of the 1998 revision of the Consumer Price Index, Monthly Labor Review 119(12):3-9.

Table 3. Major milestones in the 1998 CPI revision

Milestone	Date
Introduce revised hospital services item structure and sample	February 1997 (index for January 1997)
Introduce new geographic sample and item structure and update expenditure weights to 1993-95	February 1998 (index for January 1998)
Begin pricing of new housing sample using computer-assisted data collection	June 1998
Introduce new housing sample and estimator into CPI	February 1999 (index for January 1999)
Rebase CPI to 1993-95 = 100	February 1999 (index for January 1999)
Introduce computer-assisted data collection for commodities and services sample	Summer 1999
Begin shift from area sample rotation to item category rotation using telephone Point-of-Purchase Survey	Early 1999
Enter redesigned Consumer Expenditure Survey processing system into full production	October 1999

Source: Greenlees, J.S. and Mason, C.C., 1996, Overview of the 1998 revision of the Consumer Price Index, Monthly Labor Review 119(12):3-9.

Geographic Area Sample

The geographic sample selection process uses stratified sampling to represent the U.S. urban population. There will be 87 primary sampling units based on the 1990 decennial census, replacing the current ones that are representative of the 1980 U.S. population distribution. Of these, 36 will be new, with new outlet and item pricing samples for the 1998 revised Index. The remaining 51 are carried over from the current CPI geographic sample.

Item Structure

The present seven major groups of goods and services will be restructured into eight major groups with the creation of the "education and communications" group. This new category includes components previously included in the "recreation" and "housing" groups.

New Outlets

An expanded and re-estimated CPI sample optimization model will promote the selection of relatively fewer outlets and more items per outlet. Also, there will be a broad shift in relative sample size away from the food and beverages category and the other major groups.

Publication Strategy

BLS will continue to publish overlap indexes based on both the new and the old item structure and expenditure weight for several months beginning in February 1998. This will permit users to see firsthand the revision's effect on the published rate of inflation. Effective with the index for January 1999, the official base for the CPI will change from a 1982-84=100 to a 1993-95=100 reference base.

Housing

Two revisions will be implemented for the January 1999 Index. The new estimator for owners' equivalent rent will be based on the reweighting of the same rental observations that are used for the residential rent index. In the current CPI estimator, implicit rents for a sample of owner-occupied units are estimated by matching those units to specific rental units. The new method will not require selection of an owner-occupied sample. The second revision will be the selection of a new housing unit sample using the 1990 decennial census. In addition, new housing units constructed since the last census will be brought into the CPI housing sample through an augmentation process.

Several other changes will be incorporated in the Index. The medical care component will be extensively revised, consolidating the hospital and related services category. Pricing procedures will change from pricing individual items to pricing combined sets of goods and services provided on selected patient bills. Other technological enhancements for the 1998 CPI, with expected start dates, are shown in table 3.

BLS will continue to enhance its program of experimental indexes and research on CPI measurement issues. Nevertheless, the decennial revision process remains the primary way by which BLS maintains the quality of the CPI—thus ensuring the status of the Index as the most accurate and timely measure of changes in consumer prices.

Source: Greenlees, J.S. and Mason, C.C., 1996, Overview of the 1998 revision of the Consumer Price Index, *Monthly Labor Review* 119(*12*):3-9.

Measuring the Success of Nutrition Education and Promotion in Food Assistance Programs

When USDA's Food and Nutrition Service (FNS) began focusing on incorporating nutrition education into all its food assistance programs, FNS needed a means of measuring program effectiveness to ensure the best possible use of its limited resources. FNS was also looking for ways to identify what worked best—which program components, under what circumstances, and at what costs. The objective was to help those at the program-delivery level provide the best, most cost-effective nutrition programs possible.

As a result, a conference entitled "Charting the Course for Evaluation: How Do We Measure the Success of Nutrition Education and Promotion in Food Assistance Programs?" was held July 13-14, 1995, in Arlington, VA. Nutrition educators, market researchers, and health promotion evaluation experts, brought together to identify and promote the state of the art in evaluating nutrition education and promotion efforts, were asked to evaluate a range of nutrition education, health promotion, and social marketing programs.

Session Summaries

- **Contemporary Budget and Policy Realities: The State of Nutrition Education in USDA and the Importance of Evaluation,** Eileen Kennedy, executive director, USDA Center for Nutrition Policy

Overview of Major Themes

Although the design and implementation of nutrition education in nonclinical settings differs greatly from conducting clinical research, conference speakers argued convincingly that experimental designs used for clinical science often guide expectations for what nutrition education programs can accomplish and how they should be evaluated. The following list summarizes participants' ideas about developing and evaluating behavior-focused nutrition education programs using models appropriate for population settings:

- *Set appropriate objectives and manage expectations*: Nutrition education usually involves trying to change complex behaviors. Hence, educators must ensure that (a) expectations and objectives are appropriate for community-based programs, and (b) change is measured using program-appropriate evaluation models.

- *Define meaningful, measurable outcomes*: Often the outcomes selected for nutrition education programs are too global to measure (meaningfully) a program's effect or to be measured accurately. Outcomes need to be realistic. Identifying and measuring intermediate variables, in addition to outcome, is often critical to measuring progress.

- *Design interventions using appropriate theoretical models---and design evaluation using the same models*: Theoretical models appropriate for nutrition education include (a) stage of change, (b) social learning theory, (c) health belief, and (d) diffusion of innovations. Social marketing, a process, can be used with any of these models to develop health promotion and disease prevention programs.

- *Include both formative and process evaluation activities*: Outcome evaluation is often the only type of evaluation used for nutrition education and communication efforts. Other types of evaluation are critical to successful program development and implementation.

and Promotion—Three questions are relevant to the discussion of evaluating nutrition education programs: (1) What works? (2) In what context does nutrition education work? and (3) At what cost? To answer these questions, the mix of programs offered must be evaluated. Also, nutrition educators are headed toward a multifaceted approach to intervention strategies. Evaluation strategies must be multifaceted and must include formative, process, and outcome evaluation research.

Section I. Where We've Been

- **Overview: A Review of the Role of Evaluation in Recent Nutrition Education Research and Interventions,** Isobel Contento, coordinator, Program in Nutrition and Education, Teacher's College, Columbia University—A USDA-contracted review of 217 studies found a wide range of outcome measures used to evaluate nutrition education effectiveness, illustrating the complexity of dietary change and the difficulties of measuring such change. The review found

that nutrition education works and is a significant factor in improving dietary practices when behavior change is the goal and educational strategies are designed with that as a purpose.

- **Confounding Issues in Evaluations of Nutrition Interventions,** William Smith, executive vice president, Academy for Educational Development—The complexity of human behavior, thinking about programs as prevention "vaccines," and other factors confound our understanding of the relationship of how different human behaviors relate to health, evaluation, and research. Identifying the determinants of a behavior is key to understanding behavior. Determinants can be identified by comparing those who do and those who do not engage in a behavior. Improving the balance between basic evaluation and marketing or clinical research may be useful.

Section II. Charting a New Course: Using Communication and Behavior Models in Designing Evaluations

- **Health Belief Model,** Arlene Caggiula, associate professor, Nutrition and Epidemiology, Graduate School of Public Health, University of Pittsburgh—In the two studies reported, the health belief model predicted adherence to eating patterns low in cholesterol and total fat. The type of population, intervention program, and adherence measure affected the relative importance of the components.

- **Social Learning Theory,** Kim Reynolds, associate professor, Department of Health Behavior, University of Alabama at Birmingham— Social learning theory is useful in intervention design and in measurement—it defines mediators and

guides professionals toward different measures that can be used. Social learning theory was used in the design and intervention of the High Five program in Alabama, part of the 5 A Day program.

- **Stages of Change: The Trans-theoretical Model,** Marci Kramish Campbell, assistant professor, Department of Nutrition, University of North Carolina at Chapel Hill— This model has been applied to a variety of behaviors such as smoking cessation, addictions, weight loss, and dietary change. Several studies have shown that stage of dietary change correlates with dietary intake, particularly for dietary fat, fiber, fruits, and vegetables.

- **Persuasion and Social Marketing,** Alan Andreasen, professor, Department of Marketing and associate dean, Faculty Affairs, School of Business, Georgetown University— Social marketing is an adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to increase individual well-being and/or that of society. Social marketing focuses on behavior change and on market research in the formative, pretesting, and monitoring stages.

- **Using Formative Evaluations to Identify Target Populations,** Elizabeth Howze, chief, Health Interventions and Translation Branch, Centers for Disease Control and Prevention—The Nutrition and Physical Activity Communications Project (NuPAC) is a communications campaign designed to focus on nutrition and physical activity. Desired behaviors include a diet high in fruits and vegetables and low in fat and 30 minutes or more of moderate physical activity most days of the week.

- **The Knowledge-Attitudes-Behavior Model and Defining 'Behavior Changes,'** Tom Baranowski, professor, Division of Behavioral Sciences and Health Education, Rollins School of Public Health, Emory University— This model assumes that increases in knowledge lead to more positive attitudes and that attitudes affect behavior. The model is based on the individual and includes no environmental factors. The bottom line: knowledge-attitudes-behavior provide a poor model for designing or evaluating behavior-change programs.

- **Choosing Evaluations That Fit the Intervention and Stage of Development: Breakout Sessions,** Anne Murphy, nutrition education evaluation consultant, University of Michigan-Flint—This session focused on conducting the best evaluation possible—at the lowest cost and with the least possible error—while overcoming the many barriers to it. A distinction between evaluating and reporting was given.

- **Evaluating Social Marketing Promotions,** Craig Lefebvre, vice president and chief technical officer, Prospect Associates—When developing social marketing programs, the diffusion of innovations, social learning theory, stages of change, and consumer-based health communications models are helpful. Professionals must think about the outcomes they are evaluating and think about what a marketing communications program can achieve.

- **Program Evaluations in the Community,** Adrienne Paine-Andrews, associate director and Kari Harris, research associate, Work Group for Health Promotion and Community Development, University of Kansas—Kansas LEAN is a statewide coalition with

projects focusing on nutrition education, healthier school lunches, and physical activity opportunities in the community. To evaluate this community effort, the coalition's questions focused on process as well as intermediate and long-term outcomes.

- **Choosing Appropriate Dietary Data Collection Methods to Assess Behavior Changes,** Alan Kristal, Department of Epidemiology, Fred Hutchinson Cancer Research Center, University of Washington—The science of measuring dietary change is in its infancy, especially in the context of intervention trials. Questions for evaluating diet intervention studies were outlined and standard dietary intake measures were discussed.

III. Measuring Change in the Real World: Learning From Ongoing and Past Projects: How Related Fields Use Evaluation to Document Changes in Health Behaviors

- **What We've Learned So Far: Ten Observations for the Real World,** Elaine Bratic Arkin, health communication consultant—The first of 10 observations discussed claims that behavior change and measuring that change are possible, depending on the kind of change, with whom, the type of intervention, and the type of evaluation.

- **The Child and Adolescent Trial for Cardiovascular Health (CATCH),** Theresa Nicklas, associate professor and director, Dietary Studies, Tulane Center for Cardiovascular Health, Tulane School of Public Health and Tropical Medicine—This school-based program involving school food service, physical education, classroom curricula, and the family

was implemented successfully in diverse populations in four geographic areas of the country. *Eat Smart*, the food service intervention was used, along with *Eat Smart* process and outcome measures.

- **National Dairy Council,** Madlyn Daley, senior vice president, Marketing and Economic Research, Dairy Management, Inc.—Research was conducted on the need for dairy product information in the classroom. This was part of an effort to update the dairy industry's nutrition education program *Food, Your Choice*. The target audience for the council's educational efforts was elementary students. The council developed, tested, and modified two versions of *Nutrition, It Is Elementary.*

- **Minnesota Heart Health Program,** Pat Snyder, nutrition coordinator, School of Public Health, University of Minnesota—This program was a community-based research and demonstration program involving six communities. Its goals were to improve health by lowering the population levels of blood cholesterol, blood pressure, and cigarette smoking; increase physical activity; and reduce morbidity and mortality from heart disease. The focus of the school lunch program was to lower fat and sodium content in individual menu items.

- **Project LEAN,** Sarah Samuels, health program and policy consultant—Project LEAN (Low-fat Eating for America Now) was devised to accelerate a trend toward lower fat consumption by increasing the availability and accessibility of low-fat foods and to promote greater collaboration among partners. Evaluation strategies were outlined and nutrition program planning and future evaluations were discussed.

- **5 A Day,** Jerianne Heimendinger, program director, National Cancer Institute, National Institutes of Health—5 A Day's goal is to increase the average consumption of fruits and vegetables to five servings a day by the year 2000. Program components include supermarkets, mass media, redirected advertising dollars provided by the produce industry, food service, the community, and research.

- **Charting the Course From Lessons Learned,** Robert Hornik, professor, Annenberg School for Communication, University of Pennsylvania— This session focused on problems with current outcome evaluation models. For example, message exposure needs greater consideration. Some alternative models of change and alternative evaluation designs were discussed.

Full transcripts of the conference are available:

USDA, Food and Nutrition Service
Office of Analysis and Evaluation
Room 208
3101 Park Center Drive
Alexandria, VA 22302

Source: Doner, L. (ed.), 1997, *Charting the Course for Evaluation: How Do We Measure the Success of Nutrition Education and Promotion in Food Assistance Programs? Summary of Proceedings.* USDA, Office of Analysis and Evaluation, Food and Consumer Service, February 28.
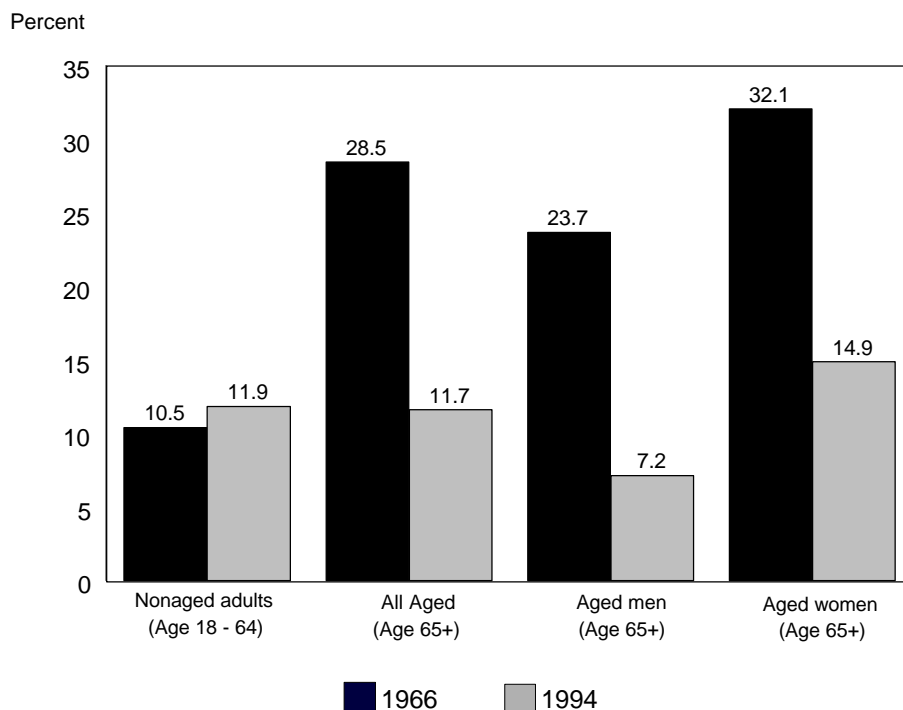
Poverty Among Older Women

Although there has been a substantial improvement in the economic status of the aged (people aged 65 or older) over the past 30 years because of the Social Security retirement program and Supplemental Security Income (SSI) system, the incidence of poverty among aged women remains disproportionately high. Among the elderly, women are twice as likely to be poor as are men, with 14.9 percent living in poverty in 1994, compared with only 7.2 percent of men (see figure). Elderly Black and Hispanic women are even more likely to be poor.

There are two types of explanations as to why the incidence of poverty is so high among aged women. One is living conditions or personal characteristics (e.g., advanced old age or living alone) that are associated with poverty. The other points to particular events that are linked to the onset of poverty later in life, such as earnings loss, widowhood, or declining health.

The authors of this report focused on the relationship between women's economic status earlier in life and their poverty status in old age to determine if poverty in old age is linked to conditions and events that occur earlier in life. This research examines the extent to which poverty among older women is the result of specific events that happen in old age or is more likely to be a continuation of earlier-life conditions. It is important to know the origins of poverty among elderly women so that appropriate policies can be formulated to help them.

Percentage of persons in poverty, by age and sex, 1966 and 1994

Source: Choudhury, S. and Leonesio, M.V., 1997, Life-cycle aspects of poverty among older women, Social Security Bulletin 60(2):17-36.

The data used in this study are from the National Longitudinal Survey of Mature Women (NLSMW), which is conducted by the Bureau of Labor Statistics. This survey has been collecting data on the economic lives of 5,000 American women for over three decades. The sample was chosen to be representative of the civilian, noninstitutionalized population, although Black women were oversampled to make valid statistical inferences in instances of different experiences and outcomes for Whites and Blacks. The first interview took place in 1967 when the participants were aged 30-44. Over the next 25 years, the participants were interviewed 16 times, 9 of which were in-person interviews. By 1992, the 3,000 women who remained in the survey were

aged 55-69. These longitudinal data provide a detailed look at the economic status of women born between 1923 and 1937 and show how earlier life circumstances can influence women's economic status in old age.

The study focused on the correlates and determinants of poverty for women who have reached age 62—defined here as the beginning of old age. Long-term poverty experiences of middle-aged women are likely to be linked to their economic status in old age.

To assess the economic status of the NLSMW participants in various years, annual family income (including food stamp income) was divided by the

Correlates of old-age poverty among women, by age group, 1991-92

Characteristic	Aged 55-61		Aged 62-69	
	Poor and near poor (IPR[1]<1.25)	All others (IPR[1]≥1.25)	Poor and near poor (IPR[1]<1.25)	All others (IPR[1]≥1.25)
Sample size	248	754	267	716
Total percent	100	100	100	100
Education (years in school)				
0 - 8	25.6	4.7	36.2	9.2
9 -12	64.6	60.8	54.5	61.9
13 - 16	8.1	28.4	7.5	23.7
17 or more	(2)	6.2	(2)	5.2
Health				
Excellent/good	53.0	81.7	50.0	74.4
Fair/poor	47.0	18.4	50.0	25.7
Marital status				
Married/spouse present	39.9	71.3	26.1	59.5
Widowed	23.4	10.2	46.2	28.9
Divorced	20.7	13.6	19.5	7.4
Separated	7.6	1.8	3.3	1.1
Never married	8.0	3.1	4.8	3.2
Region				
South	46.6	29.7	47.1	31.5
Nonsouth	53.5	70.3	52.9	68.5
Race				
White	64.5	91.9	77.5	93.8
Non-White	35.5	8.1	22.5	6.2
Pension receipt[3]				
Yes	15.5	35.9	24.5	56.3
No	84.5	64.1	75.5	43.8
Living arrangement[4]				
Alone	39.3	18.2	17.1	11.4
With spouse	39.9	71.3	26.1	59.5
Other	20.8	10.5	56.9	29.2
Number of children[5]				
None	8.8	8.6	13.5	10.2
1 - 2	27.2	28.4	26.4	31.8
3 - 4	29.1	41.6	27.1	38.9
5 or more	35.0	21.4	33.0	19.1

[1]Income-to-poverty ratio.
[2]Fewer than 10 unweighted cases.
[3]Includes sources such as income from private employers, unions, military, and all levels of government as well as from IRA and Keogh plans.
[4]Those living with spouse may live in households with additional members.
[5]This was asked in 1977. In a 1982 question on additional children born in the past 5 years, only 12 women responded in the affirmative.

Note: Percentages are computed using National Longitudinal Survey of Mature Women (NLSMW) weights. Poverty status is determined as of the 1992 interview. The IPR for those who are poor and near poor is <1.25 and for all others, it is ≥1.25. The sample size represents the unweighted cases. The sample consists of observations of 1991-92 survey respondents who report complete income information. Table entries represent the percent of the poor and near poor/all others in the two age groups who have the listed characteristics. Column sums for each variable for each age group may not add to 100 percent due to rounding.

Source: Choudhury, S. and Leonesio, M.V., 1997, Life-cycle aspects of poverty among older women, Social Security Bulletin 60(2):17-36.

relevant poverty threshold to compute income-to-poverty ratios (IPRs) for particular survey years. Women are considered poor if their IPR is less than 1 and near-poor if their IPR is greater than or equal to 1 and less than 1.25.

A large portion of the income of the lower income elderly is made up of Social Security and other public transfer programs such as SSI and food stamps. For the poor and near-poor groups of women aged 62 or older, Social Security and other government cash transfers made up 80 percent of family income in 1991-92 but only 33 percent of total income for all other women (who have an IPR greater than or equal to 1.25).

Economic status is predictably correlated with certain characteristics of individuals and their families (see table). Being poor or near-poor is positively correlated with lower levels of education, poorer health, being unmarried, being non-White, living in the South, having little private pension income, living alone, and having five or more children. Married couples are considerably less likely to be poor than are unmarried individuals. Over 60 percent of older Black women experienced at least one spell of poverty, compared with 26 percent of White women. The likelihood that a woman will endure a poverty spell over her life cycle increased with the number of children. Attaining 8 years or less of schooling is strongly associated with one or more poverty spells. Women who report 2 years or less of labor market activity during the survey period face a 40-percent chance of being poor one or more times.

Women's economic histories strongly predict their financial circumstances at age 62 or older. Three of four women who were poor in 1991-92 had earlier documented poverty spells; whereas, only 4 percent of women who had never experienced poverty were poor in 1991-92. Of women who had earlier been predominantly poor, 60 percent were still poor in 1991-92.

Traumatic events might be expected to worsen the economic status of women and lead to poverty by age 62 or older. For her or her husband, these events include a major health problem, the involuntary loss of income, or a loss of earnings because of retirement. It was found that traumatic events that happen in old age are sometimes associated with poverty among aged women, particularly those who are ill-prepared to finance retirement and slip into poverty when additional adverse circumstances take place. Unlike divorce, widowhood, or poor health, retirement is considered to be a voluntary act and was found to be an unreliable indicator of subsequent poverty.

Education and total number of children were found to have a large influence on being poor prior to reaching age 62, as were race and marital history. In general, earlier-life conditions appear to be strong precursors of poverty status in old age, with later-life events having much less influence. Whether or not women enter poverty because of adverse later-life events depends on their economic resources just before the event. For many women, widowhood and divorce bring about economic hardship, but for most older women, these types of traumatic events do not appear to bring about poverty spells.

Policymakers who deal with programs intended to alleviate poverty among aged women can benefit from these findings. Since old-age poverty was found to be strongly linked to financial status over many years earlier in life, three strategies are suggested:

- Reform Social Security to alter the link between program benefits that women receive and earlier-life earnings, placing more emphasis on benefit adequacy. This type of policy change would include establishing a minimum benefit at or near the poverty thresholds or assigning higher weight to low earnings in determining an individual's benefit amount.

- Increase older women's income directly by increased public transfers through programs such as Supplemental Security Income.

- Target specific groups of women thought to be particularly vulnerable in old age, such as widows and single older women or women aged 80 or older. Automatic increases in monthly benefit amounts, elimination of the widow's limit, or a cost-neutral shift of benefits from married couples to survivors are examples of policy changes. However, the strong link between earlier-life economic status and eventual poverty status in old age suggests policies that increase the income-generating capacity of women earlier in their lives. These types of policies might have beneficial effects that last into the retirement years.

Source: Choudhury, S. and Leonesio, M.V., 1997, Life-cycle aspects of poverty among older women, *Social Security Bulletin* 60*(2)*:17-36.

# Federal Statistics: Children and Family Composition

Children and Family Composition in the United States

Today's U.S. children under age 18 live in different family structures than children did during the 1970's. Families have changed, and these changes have implications for the circumstances of children. Now, children compose a smaller percentage of the population than they did years ago. More children are living in single-parent families, often headed by a never-married parent. These different family structures influence the economic well-being of children.

Children as a percentage of population:

Children now compose a lower percentage of the population. In 1970, 34 percent of the population was under age 18; in 1996, 26 percent was. By 2010, 24 percent of the population will be under age 18. Families having fewer children and people living longer are reasons for this trend.

### Percent of U.S. population under age 18
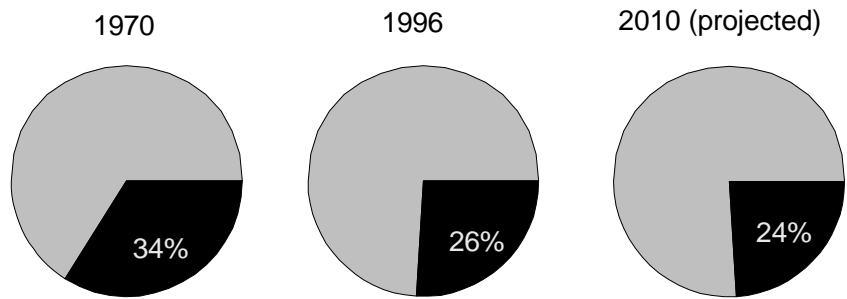
Source: U.S. Department of Health and Human Services, Trends in the Well-Being of America's Children and Youth '97.
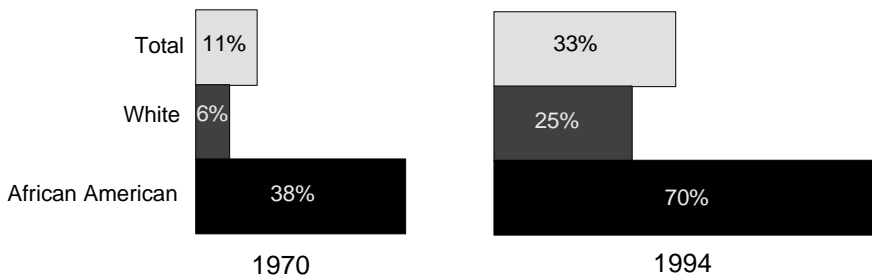
Children and family type:

More children are living with one parent. In 1970, one-parent families with children accounted for 13 percent of all families with children. By 1996, this figure increased to 31 percent. More of these one-parent family groups are headed by the father: 1 percent in 1970, compared with 5 percent in 1996.

Percent of U.S. two-parent and one-parent family groups with children
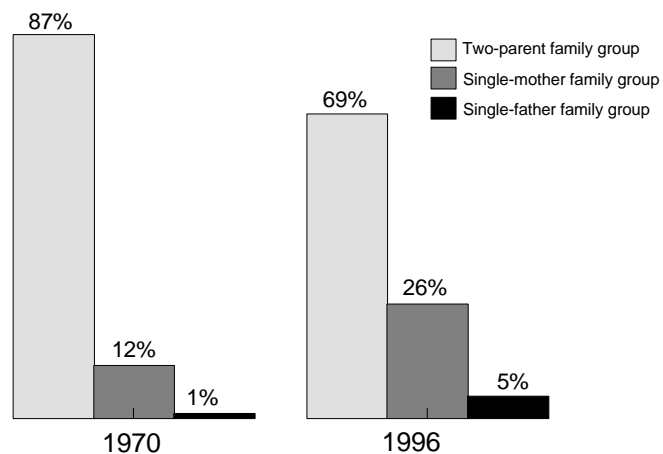
Source: U.S. Department of Commerce, Bureau of the Census, 1997, Statistical Abstract of the United States: 1997 (117th ed.).

## Percent of all U.S. births to unmarried women, overall and by race

Total 11%
White 6%
African American 38%

1970

Total 33%
White 25%
African American 70%

1994

Children and their mother's marital status:

A greater number of single-parent families are being formed through births to unmarried women than through divorce or widowhood. Births to unmarried women accounted for 11 percent of all births in 1970, compared with 33 percent in 1994. The rate is particularly high for African American women. In 1994, 70 percent of all births to African American women were to unmarried women.

Percent of children in the United States in poverty over time
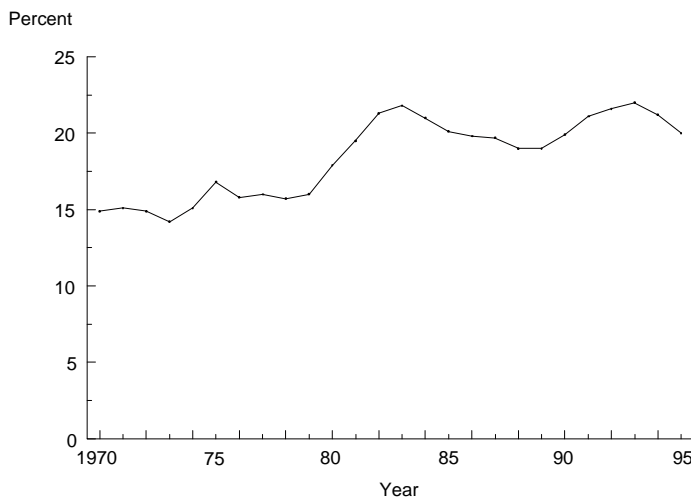
Percent

25

20

15

10

5

0

1970   75   80   85   90   95

Year

Children and poverty:

Single-parent families typically have a much lower income than do married-couple families. The increase in such families is one reason for the increase in children living in households where the income is below the poverty threshold. In 1970, 14.9 percent of all children were poor. By 1995, this figure rose to 20 percent.

Research and Evaluation Activities in USDA

From the Food and Rural Economics Division, Economic Research Service

The Food and Rural Economics Division reports on six studies of interest to the family economics and nutrition community.

USDA's Healthy Eating Index and Nutrition Information, J.N. Variyam, J. Blaylock, D. Smallwood, and P. Basiotis, Economic Research Service and Center for Nutrition Policy and Promotion, Technical Bulletin-1866, April 1998.

A comprehensive model is developed to measure the extent that nutrition knowledge and diet-health awareness, among other factors, influence an individual's Healthy Eating Index (HEI), USDA's measure of overall diet quality. This is the first study that rigorously attempts to examine variation in the Index across population groups by controlling for personal and household characteristics and nutrition information levels, as well as test for the endogeneity of nutrition information. Results indicate that one's level of nutrition information has an important influence on one's HEI. Results also indicate that nutrition information and the HEI are simultaneously determined. Other factors explaining variations in HEI's across individuals are income and education levels, race, ethnicity, and age. Evidence supports the hypothesis that higher education promotes more healthful food choices through better acquisition and use of health information.

Changes in the Social and Economic Status of Women, by Metro-Nonmetro Residence, C. Rogers, Economic Research Service, Agricultural Information Bulletin-732, February 1997.

This study presents a review and an appraisal of the advancement of women, especially nonmetro women, during the 1980's and mid-1990's. Trends in gender differences in educational attainment, labor force attachment, earnings, and occupational placement are analyzed by metro-nonmetro residence. In 1994, 55 percent of nonmetro women and 59 percent of metro women age 25 and older were in the labor force, an increase of 10 percentage points from 1980 for women in both areas. While greater gender equity has substantially improved in the United States, nonmetro women have not consistently improved their standing relative to men when compared with women in metro areas. By 1993, nonmetro women's earnings were 69 percent of men's, up from 58 percent in 1979. Female college graduates had earnings roughly 73 percent of men's in 1993, up 13 percentage points from 1979. The narrowing of the earnings gap reflects a number of changes in women's life experiences (delayed marriage and childbearing, increased labor force participation, and greater educational equity with men), as well as lower wages for men. High poverty rates among nonmetro women are cause for public policy concern. The 1993 poverty rate for nonmetro women was 19.3 percent, compared with 16.2 percent for metro women and 15.0 percent for nonmetro men.

Diet-Health Information and Nutrition: Intake of Fats and Cholesterol, J.N. Variyam, J. Blaylock, and D. Smallwood, Economic Research Service, Technical Bulletin-1855, February 1997.

Diet-health information and nutrient intake data for a sample of U.S. household meal planners are used to estimate the effect of information on the intake of fat, saturated fat, and cholesterol. Results indicate that an awareness of health problems resulting from excess intake of these nutrients and the self-assessed importance of avoiding too much of these nutrients in one's diet have significant influence on nutrient intake. Personal and household characteristics significantly affecting nutrient intake include income, schooling, age, sex, race, ethnicity, body mass index, vegetarian status, and dieting status.

Do the Poor Pay More for Food? Item Selection and Price Differences Affect Low Income Household Food Costs, P.R. Kaufman, J. MacDonald, S. Lutz, and D. Smallwood, Economic Research Service, Agricultural Economics Report-759, November 1997.

Low-income households may face higher food prices for three reasons: (1) on average, low-income households spend less in supermarkets—which typically offer the lowest prices and greatest range of brands, package sizes, and quality choices; (2) low-income households are less likely to live in suburban locations where food prices are typically lower; and (3) supermarkets may charge higher prices in low-income neighborhoods.

This report looks at the types of food items low-income households select, the types of food stores to which they have access, and the amount they pay for food items. In areas with limited kinds and locations of food stores, households may have sharply higher food costs.

How Economic Factors Influence the Nutrient Content of Diets, *K.S. Huang, Economic Research Service, Technical Bulletin-1864, November 1997.*

Economic factors such as food prices and consumer income affect food choices, with consequences for the availability of nutrients. A new research model is developed to estimate how the availability of 28 nutrients would change as consumers alter their food purchases in response to changes in 35 food prices and income through the interdependent food demand relationships. Results show that a 10-percent decrease in the price of beef or cheese would increase daily availabilities of energy by 9.49 and 11.39 calories, and saturated fatty acids by 0.33 and 0.37 grams, respectively. The same price decrease for beef or eggs would increase cholesterol by 1.49 and 1.09 milligrams, respectively. The same price decrease for fluid milk or evaporated and dry milk would increase calcium availability by 5.56 and 11.78 milligrams, respectively. A 10-percent decrease in the price of beef and wheat flour could increase the daily availability of iron by 0.19 and 0.06 milligrams, respectively. The same price changes for oranges or fruit juices would increase daily availability of vitamin C by 1.17 and 1.15 milligrams, respectively.

Validation of a Self-Reported Measure of Household Food Insufficiency With Nutrient Intake Data, *D. Rose and V. Oliveira, Economic Research Service, Technical Bulletin-1863, August 1997.*

This study examines the relationship of self-reported food insecurity with nutrient intake data. Food-insufficient households were defined as those reporting that they sometimes or often did not get enough to eat. Nutrient adequacy ratios were calculated for 15 nutrients and averaged at the household level. Multiple regressions were used to study the association of food sufficiency with nutrient intake while controlling for age, race-ethnicity, and schooling of household head; income status, size, and composition of the household; and geographic and seasonal influences. Food insufficiency was associated with significantly decreased intake of 13 nutrients—relative differences ranging from 8 to 18 percent of consumption levels in food-sufficient households.

For more information about these studies, call 1-800-999-6779. For additional information about ERS publications, databases, and other products visit the ERS Home Page on the Internet at http://www.econ.ag.gov

Official USDA Food Plans: Cost of Food at Home at Four Levels, U.S. Average, September 1998[1]

AGE-GENDER GROUPS	WEEKLY COST				MONTHLY COST			
	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan
INDIVIDUALS[2]								
CHILD:								
1-2 years	$15.10	$18.60	$21.80	$26.40	$65.40	$80.60	$94.50	$114.40
3-5 years	16.40	20.30	25.20	30.20	71.10	88.00	109.20	130.90
6-8 years	20.20	27.10	33.70	39.20	87.50	117.40	146.00	169.90
9-11 years	24.00	30.70	39.20	45.40	104.00	133.00	169.90	196.70
MALE:								
12-14 years	24.90	34.70	43.00	50.50	107.90	150.40	186.30	218.80
15-19 years	25.70	35.70	44.40	51.30	111.40	154.70	192.40	222.30
20-50 years	27.60	35.50	44.20	53.60	119.60	153.80	191.50	232.20
51 years and over	24.90	33.80	41.60	49.90	107.90	146.50	180.30	216.20
FEMALE:								
12-19 years	24.80	29.80	36.20	43.70	107.50	129.10	156.90	189.40
20-50 years	24.80	31.00	37.70	48.30	107.50	134.30	163.40	209.30
51 years and over	24.40	30.10	37.40	44.70	105.70	130.40	162.10	193.70
FAMILIES:								
FAMILY of 2[3]**:**								
20-50 years	57.60	73.20	90.10	112.10	249.80	316.90	390.40	485.70
51 years and over	54.20	70.30	86.90	104.10	235.00	304.60	376.60	450.90
FAMILY OF 4:								
Couple, 20-50 years and children—								
1-2 and 3-5 years	83.90	105.40	128.90	158.50	363.60	456.70	558.60	686.80
6-8 and 9-11 years	96.60	124.30	154.80	186.50	418.60	538.50	670.80	808.10

[1]Basis is that all meals and snacks are purchased at stores and prepared at home. For specific foods and quantities of foods in the Low-Cost, Moderate-Cost, and Liberal Plans, see *Family Economics Review*, No. 2 (1983); for specific foods and quantities of foods in the Thrifty Food Plan, see *Family Economics Review*, No. 1 (1984). The food plans are based on 1977-78 Nationwide Food Consumption Survey data updated to current dollars using the Consumer Price Index for specific food items.

[2]The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person—add 20 percent; 2-person—add 10 percent; 3-person—add 5 percent; 5- or 6-person—subtract 5 percent; 7- (or more) person—subtract 10 percent.

[3]Ten percent added for family size adjustment.

Consumer Prices
Consumer Price Index of all urban consumers [1982-84=100], selected years

GROUP	Annual average percent change from previous year			Percent change 12 months ending with September 1998
	1990	1995	1997	
All Items	5.4	2.8	2.3	1.5
Food	5.8	2.8	2.6	2.0
Food at home	6.5	3.3	2.5	1.6
Food away from home	4.7	2.3	2.8	2.7
Housing	4.5	2.6	2.6	2.4
Apparel and upkeep	4.6	-1.0	.9	.5
Transportation	5.6	3.6	.9	-2.5
Medical care	9.0	4.5	2.8	3.6
Entertainment	4.7	2.5	2.1	NA
Recreation	NA	1.9	2.3	1.4
Education and communication	NA	3.8	3.3	1.2
Other goods and services	4.7	4.2	4.4	5.4

Food	Price per pound unless otherwise noted (as of December in each year)			September
	1990	1995	1997	1998
Flour, white, all purpose	$ .24	$ .24	$ .28	$ .30
Rice, white, long grain, uncooked	.49	.55	.58	.54
Spaghetti and macaroni	.85	.88	.88	.88
Bread, white	.70	.84	.88	.86
Beef, ground, uncooked	1.63	1.40	1.39	1.36
Pork chops, center cut, bone-in	3.32	3.29	3.39	3.23
Chicken, fresh, whole	.86	.94	1.00	1.07
Tuna, light, chunk	2.11	2.00	2.03	2.11
Eggs, Grade A, large, per dozen	1.00	1.16	1.17	1.02
Milk, fresh, lowfat, per gallon	NA	2.31	2.41	2.62
Butter, salted, grade AA, stick	1.92	1.73	2.46	3.37
Apples, red delicious	.77	.83	.90	.97
Bananas	.43	.45	.46	.48
Oranges, navel	.56	.64	.58	NA
Potatoes, white	.32	.38	.37	.38
Lettuce, iceberg	.58	.61	.70	.71
Tomatoes, field grown	.86	1.51	1.62	1.24
Broccoli	NA	.76	.93	1.01
Carrots, short trimmed and topped	.43	.53	.50	.53
Onions, dry yellow	NA	.41	.46	NA
Orange juice, frozen concentrate per 16 oz.	2.02	1.57	1.67	1.60
Sugar, white, 33-80 oz. pkg.	.40	.39	.41	.42
Margarine, stick	.87	.79	.80	NA
Peanut butter, creamy, all sizes	2.09	1.78	1.73	1.79
Coffee, all sizes	2.94	3.51	4.16	3.62

NA = Data not available for publication.
Selected items from CPI Detailed Reports, Bureau of Labor Statistics, various issues. Consumer Price Index data are considered a better measure over time than actual price data. All data rounded to the nearest cent.

U.S. Poverty Thresholds

Weighted average poverty thresholds[1] for nonfarm families of specified size, 1970-97

| Calendar year | Unrelated individuals | | | Families of 2 persons or more | | | | | | | Annual average CPI, all items (1982-84 = 100) |
| | All ages | Under age 65 | Age 65 or older | 2 persons | | | 3 persons | 4 persons | 5 persons | 6 persons | |
				All ages	Householder under age 65	Householder age 65 or older					
1970	$1,954	$2,010	$1,861	$2,525	$2,604	$2,348	$3,099	$3,968	$4,680	$5,260	38.8
1971	2,040	2,098	1,940	2,633	2,716	2,448	3,229	4,137	4,880	5,489	40.5
1972	2,109	2,168	2,005	2,724	2,808	2,530	3,339	4,275	5,044	5,673	41.8
1973	2,247	2,307	2,130	2,895	2,984	2,688	3,548	4,540	5,358	6,028	44.4
1974	2,495	2,562	2,364	3,211	3,312	2,982	3,936	5,038	5,950	6,699	49.3
1975	2,724	2,797	2,581	3,506	3,617	3,257	4,293	5,500	6,499	7,316	53.8
1976	2,884	2,959	2,730	3,711	3,826	3,445	4,540	5,815	6,876	7,760	56.9
1977	3,075	3,152	2,906	3,951	4,072	3,666	4,833	6,191	7,320	8,261	60.6
1978	3,311	3,392	3,127	4,249	4,383	3,944	5,201	6,662	7,880	8,891	65.2
1979	3,689	3,778	3,479	4,725	4,878	4,390	5,784	7,412	8,775	9,914	72.6
1980	4,190	4,290	3,949	5,363	5,537	4,983	6,565	8,414	9,966	11,269	82.4
1981	4,620	4,729	4,359	5,917	6,111	5,498	7,250	9,287	11,007	12,449	90.9
1982	4,901	5,019	4,626	6,281	6,487	5,836	7,693	9,862	11,684	13,207	96.5
1983	5,061	5,180	4,775	6,483	6,697	6,023	7,938	10,178	12,049	13,630	99.6
1984	5,278	5,400	4,979	6,762	6,983	6,282	8,277	10,609	12,566	14,207	103.9
1985	5,469	5,593	5,156	6,998	7,231	6,503	8,573	10,989	13,007	14,696	107.6
1986	5,572	5,701	5,255	7,138	7,372	6,630	8,737	11,203	13,259	14,986	109.6
1987	5,778	5,909	5,447	7,397	7,641	6,872	9,056	11,611	13,737	15,509	113.6
1988	6,024	6,155	5,674	7,704	7,958	7,158	9,435	12,092	14,305	16,149	118.3
1989	6,311	6,451	5,947	8,076	8,343	7,501	9,885	12,675	14,990	16,921	124.0
1990	6,652	6,800	6,268	8,512	8,794	7,906	10,419	13,360	15,800	17,835	130.7
1991	6,932	7,086	6,532	8,867	9,164	8,238	10,857	13,921	16,457	18,590	136.2
1992	7,141	7,299	6,729	9,132	9,441	8,489	11,187	14,343	16,951	19,146	140.3
1993	7,357	7,517	6,930	9,410	9,726	8,741	11,521	14,764	17,459	19,710	144.5
1994	7,551	7,710	7,107	9,655	9,977	8,964	11,817	15,141	17,896	20,223	148.2
1995	7,761	7,929	7,309	9,935	10,259	9,221	12,156	15,570	18,407	20,808	152.4
1996	7,992	8,163	7,525	10,226	10,562	9,491	12,517	16,029	18,951	21,418	156.9
1997[2]	8,178	8,350	7,698	10,468	10,806	9,709	12,803	16,404	19,387	21,880	160.5

[1]The **poverty thresholds** are used by the Bureau of the Census to prepare its statistical estimates of the number of individuals and families in poverty. The **poverty guidelines** are a simplified version of these poverty thresholds and are issued by the U.S. Department of Health and Human Services for administrative purposes. The poverty guidelines are used to determine whether a person or family is financially eligible for assistance or services under a particular Federal program.

[2]These average poverty thresholds were derived by increasing the 1996 thresholds by a factor of 1.022945, which reflects the percent change in the average annual Consumer Price Index (CPI-U) between 1996 and 1997.

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