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Household Food Security in the United States in 2016

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Household Food Security in the United States in 2016

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Abstract

An estimated 87.7 percent of American households were food secure throughout the entire year in 2016, meaning they had access at all times to enough food for an active, healthy life for all household members. The remaining households (12.3 percent) were food insecure at least some time during the year, including 4.9 percent with very low food security, meaning that at times the food intake of one or more household members was reduced and their eating patterns were disrupted because the household lacked money and other resources for obtaining food. Changes from 2015 to 2016 in food insecurity overall (from 12.7 to 12.3 percent) and in very low food security (from 5.0 to 4.9 percent) were not statistically significant, but they continued a downward trend in food insecurity from a high of 14.9 percent in 2011. Among children, changes from 2015 in food insecurity and very low food security were also not statistically significant. Children and adults were food insecure in 8.0 percent of households with children in 2016, essentially unchanged from 7.8 percent in 2015. Very low food security among children was 0.8 percent in 2016, essentially unchanged from 0.7 percent in 2015. In 2016, the typical food-secure household spent 29 percent more on food than the typical food-insecure household of the same size and household composition. About 59 percent of food-insecure households participated in one or more of the three largest Federal food and nutrition assistance programs during the month prior to the 2016 survey (food stamps (SNAP); Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); and the National School Lunch Program).

Keywords: Food security, food insecurity, food spending, food pantry, soup kitchen, emergency kitchen, material well-being, material hardship, Supplemental Nutrition Assistance Program, SNAP, Food Stamp Program, National School Lunch Program, Special Supplemental Nutrition Program for Women, Infants, and Children, WIC

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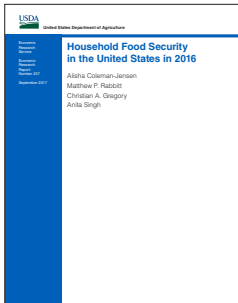
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Household Food Security in the United States in 2016

Alisha Coleman-Jensen, Matthew P. Rabbitt,
Christian A. Gregory, and Anita Singh

What Is the Issue?

Most U.S. households have consistent, dependable access to enough food for active, healthy living—they are food secure. But some American households experience food insecurity at times during the year, meaning their access to adequate food is limited by a lack of money and other resources. USDA's food and nutrition assistance programs increase food security by providing low-income households access to food for a healthful diet and nutrition education. USDA monitors the extent and severity of food insecurity in U.S. households through an annual, nationally representative survey sponsored and analyzed by USDA's Economic Research Service (ERS). This report presents statistics from the survey that cover household food security, food expenditures, and use of Federal food and nutrition assistance programs in 2016.

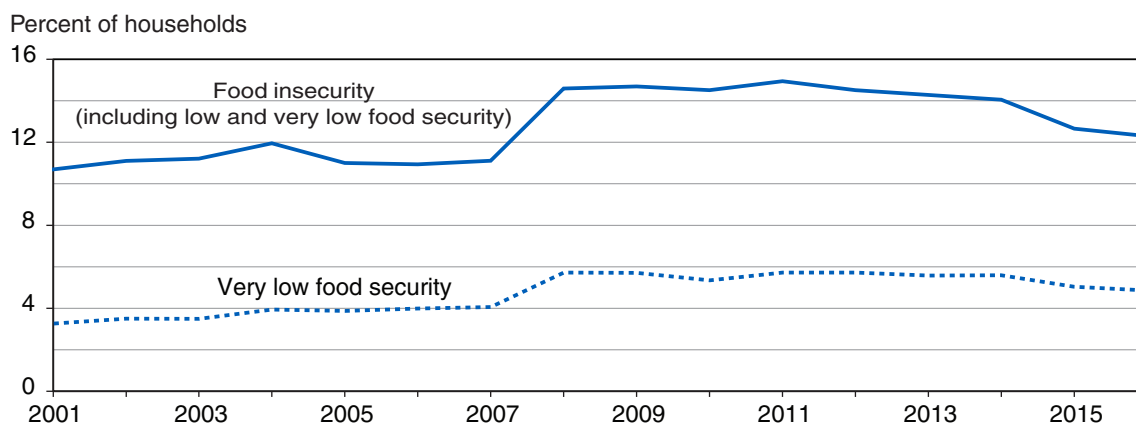
What Did the Study Find?

The estimated percentage of U.S. households that were food insecure in 2016—12.3 percent—was essentially unchanged from 2015 (12.7 percent), but continued a downward trend from a high of 14.9 percent in 2011. Both the cumulative decline in food insecurity from 2011 to 2014 (14.9 to 14.0 percent) and the year-to-year decline from 2014 to 2015 (14.0 to 12.7 percent) were statistically significant, and the downward trend, though slower, continued through 2016. However, the 2016 prevalence of food insecurity was still above the 2007 pre-recession level of 11.1 percent.

- In 2016, 87.7 percent of U.S. households were food secure throughout the year. The remaining 12.3 percent (15.6 million households) were food insecure. Food-insecure households (those with low and very low food security) had difficulty at some time during the year providing enough food for all their members due to a lack of resources.
- In 2016, 4.9 percent of U.S. households (6.1 million households) had *very low food security*, essentially unchanged from 5.0 percent in 2015. In this more severe range of food insecurity, the food intake of some household members was reduced and normal eating patterns were disrupted at times during the year due to limited resources.
- Children were food insecure at times during the year in 8.0 percent of U.S. households with children (3.1 million households), essentially unchanged from 7.8 percent in 2015. These households were unable at times during the year to provide adequate, nutritious food for their children. As in 2015, the 2016 prevalence of food insecurity among children was near the pre-recession level of 8.3 percent in 2007.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

Prevalence of food insecurity and very low food security in 2016 essentially unchanged from 2015, continues downward trend



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey Food Security Supplement.

- While children are usually shielded from the disrupted eating patterns and reduced food intake that characterize very low food security, in 2016 both children and adults experienced instances of very low food security in 0.8 percent of households with children (298,000 households), essentially unchanged from 0.7 percent in 2015.
- Rates of food insecurity were substantially higher than the national average for households with incomes near or below the Federal poverty line, households with children headed by single women or single men, women and men living alone, Black- and Hispanic-headed households, and households in principal cities and nonmetropolitan areas.
- The prevalence of food insecurity varied considerably from State to State, ranging from 8.7 percent in Hawaii to 18.7 percent in Mississippi in 2014-16. (Data for 3 years were combined to provide more reliable State-level statistics.)
- The typical (median) food-secure household spent 29 percent more for food than the typical food-insecure household of the same size and composition. These estimates include food purchases made with Supplemental Nutrition Assistance Program (SNAP, formerly food stamps) benefits.
- About 59 percent of food-insecure households in the survey reported that, in the previous month, they had participated in one or more of the three largest Federal nutrition assistance programs (SNAP; Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); and National School Lunch Program).

How Was the Study Conducted?

Data for the ERS food security reports come from an annual survey conducted by the U.S. Census Bureau as a supplement to the monthly Current Population Survey. ERS sponsors the annual survey and compiles and analyzes the responses. The 2016 food security survey covered 41,186 households, comprising a representative sample of the U.S. civilian population of 126 million households. The food security survey asked one adult respondent per household questions about experiences and behaviors that indicate food insecurity, such as being unable to afford balanced meals, cutting the size of meals, or being hungry because of too little money for food. The food security status of the household was assigned based on the number of food-insecure conditions reported.

Household Food Security in the United States in 2016

Introduction

Since 1995, the U.S. Department of Agriculture has collected information annually on food access and adequacy, food spending, and sources of food assistance for the U.S. population. The information is collected in an annual survey, the Food Security Supplement, conducted by the U.S. Census Bureau as a supplement to the nationally representative Current Population Survey.¹ A major impetus for this data collection is to provide information about the prevalence and severity of food insecurity in U.S. households. Previous reports in the series are available on the ERS website.

This report updates the national statistics on food security, household food spending, and the use of Federal food and nutrition assistance by food-insecure households, using data collected in the December 2016 food security survey—the 22nd annual survey in the Nation’s food security monitoring system. Additional statistics, including the prevalence of food insecurity during the 30 days prior to the food security survey, the frequency of occurrence of food-insecure conditions, and use of food pantries and emergency kitchens are available in the Statistical Supplement (Coleman-Jensen et al., 2017).

¹See Coleman-Jensen, 2015, for the history of the food security measurement project and the development of the food security measures.

Household Food Security

Food security—access by all people at all times to enough food for an active, healthy life—is one of several conditions necessary for a population to be healthy and well-nourished. This section provides information on food security and food insecurity in U.S. households over the course of the year ending in December 2016.

Methods

The statistics presented in this report are based on data collected in the Food Security Supplement to the Current Population Survey (CPS) conducted in December 2016. The CPS currently includes about 53,000 households and is representative, at State and national levels, of the civilian, noninstitutionalized population of the United States. In December 2016, 41,186 households completed the Food Security Supplement; the remaining households were unable or unwilling to do so. Survey sample weights were calculated by the U.S. Census Bureau to indicate how many households were represented by each household that responded to the survey.² All statistics in this report were calculated by applying the Food Security Supplement weights to responses by the surveyed households, so the statistics are nationally representative.

Unless otherwise noted, statistical differences described in the text are significant at the 90-percent confidence level.³

The household food security statistics presented in this report are based on a measure of food security calculated from responses to a series of questions about conditions and behaviors that characterize households when they are having difficulty meeting basic food needs.⁴ Each question asks whether the condition or behavior occurred at any time during the previous 12 months and specifies a lack of money and other resources to obtain food as the reason. Voluntary fasting or dieting to lose weight are thereby excluded from the measure. The series includes three questions about food conditions of the household as a whole and seven about food conditions of adults in the household, and, if there are children in the household, an additional eight questions about their food conditions (see box, “Questions Used To Assess the Food Security of Households in the CPS Food Security Survey,” page 3). Responses to the 18 food security questions are reported in tables S-5 to S-7 of the Statistical Supplement (Coleman-Jensen et al., 2017). The food security status of each interviewed household is determined by the number of food-insecure conditions and behaviors the household

²In 2016, 22.3 percent of households that responded to the monthly December CPS did not complete the Food Security Supplement. Reweighting of the Supplement takes into consideration income and other information about households that completed the labor force portion of the survey but not the Food Security Supplement. This corrects, to some extent, biases that could result from nonresponse to the Supplement by households that completed only the labor force part of the survey.

³Standard errors of national-level estimates from 2011 to the present were calculated using balanced repeated replication (BRR) methods based on replicate weights computed for the CPS Food Security Supplement by the U.S. Census Bureau. For years before 2011, standard errors of national estimates use a design factor of 1.6 based on the complex CPS sample design. State-level estimates from 2010 to the present use replicate weights computed for the CPS food security supplement. Before 2010, standard errors of State-level estimates were calculated using jackknife replication methods with “month in sample” groups considered as separate independent samples. The report uses the phrase *essentially unchanged* to describe differences between estimates of a statistic for 2 years that are not statistically significant at the 90-percent confidence level.

⁴The methods used to measure the extent and severity of food insecurity have been described in a number of studies (Hamilton et al., 1997a, 1997b; Andrews et al., 1998; Bickel et al., 1998; Carlson et al., 1999; Bickel et al., 2000; Nord and Bickel, 2002). See also the assessment of the measurement methods by a panel of the Committee on National Statistics (National Research Council, 2006). Further details on the development of the measure are provided on the ERS website.

Questions Used To Assess the Food Security of Households in the CPS Food Security Survey

1. “We worried whether our food would run out before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?
2. “The food that we bought just didn’t last and we didn’t have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?
3. “We couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn’t eat because there wasn’t enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn’t enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children age 0-17)

11. “We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food.” Was that often, sometimes, or never true for you in the last 12 months?
12. “We couldn’t feed our children a balanced meal, because we couldn’t afford that.” Was that often, sometimes, or never true for you in the last 12 months?
13. “The children were not eating enough because we just couldn’t afford enough food.” Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children’s meals because there wasn’t enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn’t afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn’t enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months, did any of the children ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)

reports. Households are classified as *food secure* if they report no food-insecure conditions or only one or two food-insecure conditions. (Food-insecure conditions are indicated by responses of “often” or “sometimes” to questions 1-3 and 11-13, “almost every month” or “some months but not every month” to questions 5, 10, and 17, and “yes” to the other questions.) They are classified as *food insecure* if they report three or more food-insecure conditions.⁵ Households are classified as having *food-insecure children* if they report two or more food-insecure conditions among the children in response to questions 11-18.⁶

Food-insecure households are further classified as having either *low food security* or *very low food security*.⁷ The very low food security category identifies households in which the food intake of one or more members was reduced and eating patterns disrupted because of insufficient money and other resources for food. Households without children are classified as having *very low food security* if they report six or more food-insecure conditions. Households with children age 0-17 are classified as having *very low food security* if they report eight or more food-insecure conditions among adults and/or children (see box, “What Is ‘Very Low Food Security’?” on page 5).⁸ They are further classified as having *very low food security among children* if they report five or more food-insecure conditions among the children (that is, if they respond affirmatively to five or more of questions 11-18).

Low and very low food security differ in the extent and character of the adjustments the household makes to its eating patterns and food intake. Households classified as having *low food security* have reported multiple indications of food acquisition problems and reduced diet quality, but typically have reported few, if any, indications of reduced food intake. Those classified as having *very low food security* have reported multiple indications of reduced food intake and disrupted eating patterns due to inadequate resources for food. In most, but not all, households with *very low food security*, the survey respondent reported that he or she was hungry at some time during the year but did not eat because there was not enough money for food.

⁵To reduce the survey burden on higher income respondents, households with incomes above 185 percent of the Federal poverty line that give no indication of food-access problems on either of two preliminary screening questions are deemed to be food secure and are not asked the questions in the food security assessment series. The preliminary screening questions asked of all households are as follows:

- People do different things when they are running out of money for food in order to make their food or their food money go further. In the last 12 months, since December of last year, did you ever run short of money and try to make your food or your food money go further?
- Which of these statements best describes the food eaten in your household—enough of the kinds of food we want to eat, enough but not always the kinds of food we want to eat, sometimes not enough to eat, or often not enough to eat?

⁶Both qualitative and quantitative research studies have suggested that parents’ reports of their children’s food insecurity sometimes differed from adolescents’ self-reported food insecurity and that parents were sometimes unaware of the degree to which children reduced their own food intake due to household food insecurity (Fram et al., 2011; Nord and Hanson 2012). The extent to which underreporting of children’s food insecurity may exist is unknown (see pp. 9-10 in Coleman-Jensen, McFall, and Nord (2013) for a discussion of research on parent-reported and self-reported food insecurity among children).

⁷Prior to 2006, households with low food security were described as “food insecure without hunger” and households with very low food security were described as “food insecure with hunger.” Changes in these descriptions were made in 2006 at the recommendation of the Committee on National Statistics (National Research Council, 2006) in order to distinguish the physiological state of hunger from indicators of food availability. The criteria by which households were classified remained unchanged.

⁸Implications of differences in raw score thresholds for very low food security between households with and without children are discussed in Nord and Coleman-Jensen (2014).

What Is “Very Low Food Security”?

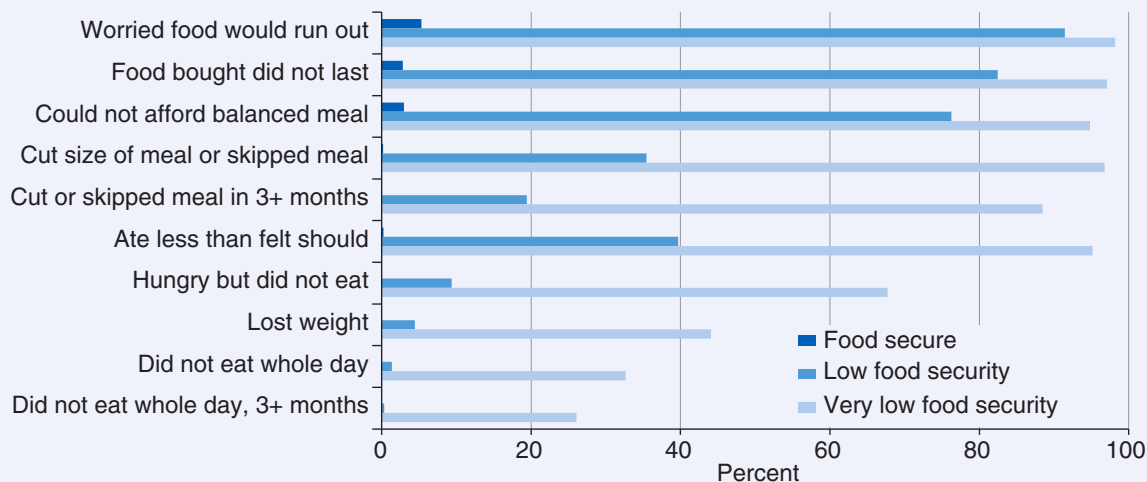
Very low food security can be characterized in terms of the conditions that households in this category reported in the food security survey. Households without children classified as having very low food security reported six or more food-insecure conditions and households with children reported eight or more food-insecure conditions, including conditions among both adults and children. Thus, the conditions reported by respondents reflect the definition of “very low food security”: at times during the year: the food intake of household members was reduced and their normal eating patterns were disrupted because the household lacked money and other resources for food. In the 2016 survey, households classified as having very low food security (representing an estimated 6.1 million households nationwide) reported the following specific conditions:

- 98 percent reported having worried that their food would run out before they got money to buy more.
- 97 percent reported that the food they bought just did not last and they did not have money to get more.
- 95 percent reported that they could not afford to eat balanced meals.

- 97 percent reported that an adult had cut the size of meals or skipped meals because there was not enough money for food.
- 88 percent reported that this had occurred in 3 or more months.
- 95 percent reported that they had eaten less than they felt they should because there was not enough money for food.
- 68 percent reported that they had been hungry but did not eat because they could not afford enough food.
- 44 percent reported having lost weight because they did not have enough money for food.
- 33 percent reported that an adult did not eat for a whole day because there was not enough money for food.
- 26 percent reported that this had occurred in 3 or more months.

As noted above, all households without children classified as having very low food security reported at least six of these conditions. The majority of households with very low food security, 66 percent, reported seven or more food-insecure conditions. (Conditions reported by households with children were similar to those without children, but the reported food-insecure conditions of both adults and children were taken into account.)

Percentage of households reporting each indicator of food insecurity, by food security status, 2016



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

Prevalence of Food Insecurity—National Conditions and Trends

An estimated 87.7 percent of U.S. households were food secure throughout the entire year in 2016 (fig. 1, table 1A). In concept, “food secure” means that all household members had access at all times to enough food for an active, healthy life (Anderson, 1990).⁹ The remaining 12.3 percent (15.6 million households) were food insecure at some time during the year. That is, they were at times unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food. A majority of food-insecure households—those classified as having low food security (but not very low food security)—avoided substantial reductions or disruptions in food intake, in many cases by relying on a few basic foods and reducing variety in their diets. But 4.9 percent (6.1 million households) had very low food security—that is, they were food insecure to the extent that eating patterns of one or more household members were disrupted and their food intake reduced, at least some time during the year, because they could not afford enough food.

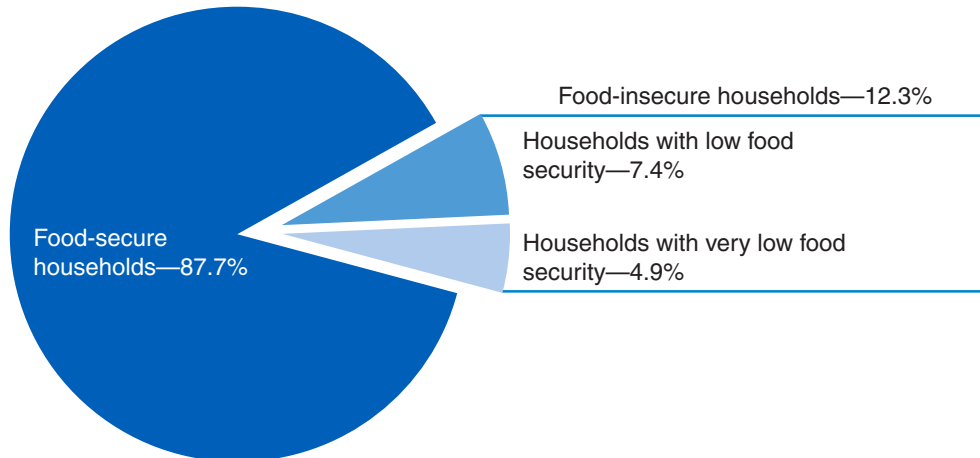
Among U.S. households with children under age 18, 83.5 percent were food secure in 2016. The remaining 16.5 percent of households with children were food insecure at some time during the year (fig. 2, table 1B). This prevalence is essentially unchanged from 16.6 percent in 2015. Parents and caregivers often are able to maintain normal or near-normal diets and meal patterns for their children, even when the parents themselves are food insecure. In about half of food-insecure households with children in 2016, only adults were food insecure (8.5 percent of households with children). However, both children and adults were food insecure in 8.0 percent of households with children (3.1 million households). In 0.8 percent of households with children (298,000 households), food insecurity among children was so severe that caregivers reported that children were hungry, skipped a meal, or did not eat for a whole day because there was not enough money for food. These households are described as having very low food security among children. In some such households, only older children may have experienced the more severe effects of food insecurity, while younger children were protected from those effects (Coleman-Jensen et al., 2013; Nord, 2009a).

The food security survey is designed to measure food security status at the household level. While it is informative to examine the number of persons living in food-insecure households, these statistics should be interpreted carefully. Within a food-insecure household, each household member may be affected differently by the household’s food insecurity. Some members—particularly young children—may experience only mild effects or none at all, while adults are more severely affected. It is more precise, therefore, to describe these statistics as representing “persons living in food-insecure households” rather than as representing “food-insecure persons.” Similarly, “persons living in households with very low food security” is a more precise description than “persons with very low food security.”

In 2016, 41.2 million people lived in food-insecure households (see table 1A). They constituted 12.9 percent of the U.S. civilian noninstitutionalized population and included 28.3 million adults and 12.9 million children (see table 1B). About 6.5 million children (8.8 percent) lived in households in which 1 or more child was food insecure. About 10.8 million adults (4.4 percent) lived in households

⁹Food security statistics, as operationally measured for this report using survey data, are based on household responses to items about whether the household was able to obtain enough food to meet its members’ needs. This operational measure does not specifically address whether the household members’ food intake was sufficient for active, healthy lives, the conceptual definition of food security. Nonetheless, research based on other data collections has found survey-based measures of food security to be statistically associated with various outcomes involving health, nutrition, and children’s development in a manner that generally supports the link between the report’s survey-based measure of food security and the conceptual definition of food security (see, for example, Coleman-Jensen et al., 2013; Gregory and Coleman-Jensen, 2017; Nord, 2009a; Nord and Hopwood, 2007; Nord and Kantor, 2006).

Figure 1

U.S. households by food security status, 2016

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

Table 1A

Households and individuals by food security status of household, 1998-2016

Category and year	Total ¹	Food secure		Food insecure					
				All		With low food security		With very low food security	
	1,000	1,000	Percent	1,000	Percent	1,000	Percent	1,000	Percent
Households:									
2016	126,401	110,850	87.7	15,551	12.3	9,413	7.4	6,138	4.9
2015	125,164	109,315	87.3	15,849	12.7	9,540	7.7	6,309	5.0
2014	124,044	106,618	86.0	17,426	14.0	10,488	8.4	6,938	5.6
2013	122,579	105,070	85.7	17,509	14.3	10,664	8.7	6,845	5.6
2012	121,546	103,914	85.5	17,632	14.5	10,679	8.8	6,953	5.7
2011	119,484	101,631	85.1	17,853	14.9	11,014	9.2	6,839	5.7
2010	118,756	101,527	85.5	17,229	14.5	10,872	9.1	6,357	5.4
2009	118,174	100,820	85.3	17,354	14.7	10,601	9.0	6,753	5.7
2008	117,565	100,416	85.4	17,149	14.6	10,426	8.9	6,723	5.7
2007	117,100	104,089	88.9	13,011	11.1	8,262	7.0	4,749	4.1
2006	115,609	102,961	89.1	12,648	10.9	8,031	6.9	4,617	4.0
2005	114,437	101,851	89.0	12,586	11.0	8,158	7.1	4,428	3.9
2004	112,967	99,473	88.1	13,494	11.9	9,045	8.0	4,449	3.9
2003	112,214	99,631	88.8	12,583	11.2	8,663	7.7	3,920	3.5
2002	108,601	96,543	88.9	12,058	11.1	8,259	7.6	3,799	3.5
2001	107,824	96,303	89.3	11,521	10.7	8,010	7.4	3,511	3.3
2000	106,043	94,942	89.5	11,101	10.5	7,786	7.3	3,315	3.1
1999	104,684	94,154	89.9	10,529	10.1	7,420	7.1	3,109	3.0
1998	103,309	91,121	88.2	12,188	11.8	8,353	8.1	3,835	3.7
All individuals (by food security status of household):²									
2016	319,029	277,825	87.1	41,204	12.9	26,556	8.3	14,648	4.6
2015	316,161	273,923	86.6	42,238	13.4	27,605	8.7	14,633	4.6
2014	313,305	265,170	84.6	48,135	15.4	30,922	9.9	17,213	5.5

Continued—

Table 1A

Households and individuals by food security status of household, 1998-2016—continued

Category and year	Total ¹	Food insecure							
		Food secure		All		With low food security		With very low food security	
		1,000	1,000	Percent	1,000	Percent	1,000	Percent	1,000
2013	310,853	261,775	84.2	49,078	15.8	31,974	10.3	17,104	5.5
2012	308,361	259,395	84.1	48,966	15.9	31,787	10.3	17,179	5.6
2011	305,893	255,773	83.6	50,120	16.4	33,232	10.9	16,888	5.5
2010	304,034	255,202	83.9	48,832	16.1	32,777	10.8	16,055	5.3
2009	301,750	251,588	83.4	50,162	16.6	32,499	10.8	17,663	5.9
2008	299,567	250,459	83.6	49,108	16.4	31,824	10.6	17,284	5.8
2007	297,042	260,813	87.8	36,229	12.2	24,287	8.2	11,942	4.0
2006	294,010	258,495	87.9	35,515	12.1	24,395	8.3	11,120	3.8
2005	291,501	256,373	87.9	35,128	12.1	24,349	8.4	10,779	3.7
2004	288,603	250,407	86.8	38,196	13.2	27,535	9.5	10,661	3.7
2003	286,410	250,155	87.3	36,255	12.7	26,622	9.3	9,633	3.4
2002	279,035	244,133	87.5	34,902	12.5	25,517	9.1	9,385	3.4
2001	276,661	243,019	87.8	33,642	12.2	24,628	8.9	9,014	3.3
2000	273,685	240,454	87.9	33,231	12.1	24,708	9.0	8,523	3.1
1999	270,318	239,304	88.5	31,015	11.5	23,237	8.6	7,779	2.9
1998	268,366	232,219	86.5	36,147	13.5	26,290	9.8	9,857	3.7
Adults (by food security status of household): ²									
2016	245,200	216,934	88.5	28,266	11.5	17,498	7.1	10,768	4.4
2015	242,706	213,586	88.0	29,120	12.0	18,235	7.5	10,885	4.5
2014	239,937	207,125	86.3	32,812	13.7	20,425	8.5	12,387	5.2
2013	237,219	203,913	86.0	33,306	14.0	21,115	8.9	12,191	5.1
2012	234,730	201,662	85.9	33,068	14.1	20,708	8.8	12,359	5.3
2011	231,385	197,923	85.5	33,462	14.5	21,371	9.2	12,091	5.2
2010	229,129	196,505	85.8	32,624	14.2	21,357	9.3	11,267	4.9
2009	227,543	194,579	85.5	32,964	14.5	20,741	9.1	12,223	5.4
2008	225,461	193,026	85.6	32,435	14.4	20,320	9.0	12,115	5.4
2007	223,467	199,672	89.4	23,795	10.6	15,602	7.0	8,193	3.7
2006	220,423	197,536	89.6	22,887	10.4	15,193	6.9	7,694	3.5
2005	217,897	195,172	89.6	22,725	10.4	15,146	7.0	7,579	3.5
2004	215,564	191,236	88.7	24,328	11.3	16,946	7.9	7,382	3.4
2003	213,441	190,451	89.2	22,990	10.8	16,358	7.7	6,632	3.1
2002	206,493	184,718	89.5	21,775	10.5	15,486	7.5	6,289	3.0
2001	204,340	183,398	89.8	20,942	10.2	14,879	7.3	6,063	3.0
2000	201,922	181,586	89.9	20,336	10.1	14,763	7.3	5,573	2.8
1999	198,900	179,960	90.5	18,941	9.5	13,869	7.0	5,072	2.5
1998	197,084	174,964	88.8	22,120	11.2	15,632	7.9	6,488	3.3

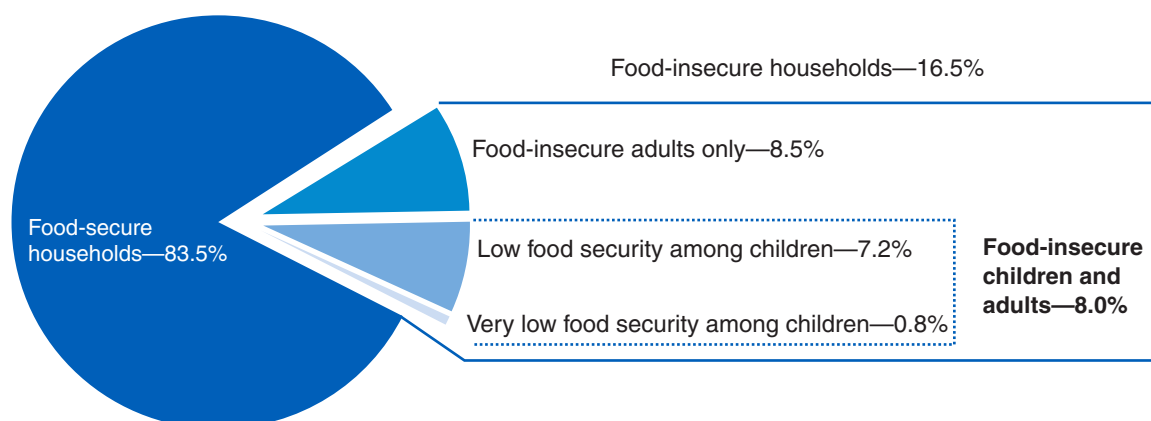
¹Totals exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale. In 2016, these exclusions represented 408,000 households (0.3 percent of all households).

²The food security survey measures food security status at the household level. Not all individuals residing in food-insecure households were directly affected by the households' food insecurity. Similarly, not all individuals in households classified as having very low food security were subject to the reductions in food intake and disruptions in eating patterns that characterize this condition. Young children, in particular, are often protected from effects of the households' food insecurity.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey Food Security Supplement.

Figure 2

U.S. households with children by food security status of adults and children, 2016



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

with very low food security (table 1A), and 703,000 children (1.0 percent) lived in households with very low food security among children (see table 1B).

Statistical Supplement tables S-2 and S-3 present estimates of the number of people and the number of children in households in each food security status and household type (Coleman-Jensen et al., 2017).

When interpreting food security statistics in this report, the reader should keep in mind that households were classified as having low or very low food security if they experienced the condition at any time during the previous 12 months. The prevalence of these conditions on any given day is far below the corresponding annual prevalence. For example, the prevalence of very low food security during the 30 days prior to the survey is 2.8 percent (table S-4) and the prevalence on an average day during the 30-day period prior to the December 2016 survey is estimated to have been between 0.6 and 0.9 percent of households (0.8 million to 1.2 million households; see box, “When Food Insecurity Occurs in U.S. Households, It Is Usually Recurrent But Not Chronic,” on page 11).¹⁰ Children, along with adults, experienced very low food security in an estimated 47,000 to 57,000 households (0.12 to 0.15 percent of all U.S. households with children) on an average day during the same period.

Food insecurity was essentially unchanged from 12.7 percent in 2015 to 12.3 percent in 2016. (The difference was not statistically significant.) There was a statistically significant decline in food insecurity from 14.0 percent in 2014 to 12.7 percent in 2015. Before that, the prevalence of food insecurity was essentially unchanged from 2013 to 2014 and from 2012 to 2014. That is, the changes were within the range that could have resulted from sampling variation. The cumulative decline from 2011 (14.9 percent) to 2014 (14.0 percent) was statistically significant, and that downward trend

¹⁰Average daily prevalence of the various behaviors, experiences, and conditions characterizing very low food security is calculated based on the proportion of households reporting the condition at any time during the previous 30 days and the average number of days in which the condition occurred. The average daily prevalence for each condition is calculated as the product of the 30-day prevalence and the average number of days experienced divided by 30. The ratio of daily prevalence to monthly prevalence of the various indicator conditions provides the basis for approximating the average daily prevalence of very low food security during the reference 30-day period. The daily rate of very low food security is expressed as a range whose lower and upper bounds are based on the minimum and maximum ratio of daily prevalence to 30-day prevalence. See table S-9 in the online Statistical Supplement.

Table 1B

Households with children by food security status, and children by food security status of household, 1998-2016

Category and year	Total ¹	Food-secure households		Food-insecure households ²		Households with food-insecure children ³		Households with very low food security among children	
		1,000	Percent	1,000	Percent	1,000	Percent	1,000	Percent
Households with children:									
2016	38,400	32,058	83.5	6,342	16.5	3,069	8.0	298	0.8
2015	38,978	32,519	83.4	6,459	16.6	3,022	7.8	274	.7
2014	39,079	31,590	80.8	7,489	19.2	3,665	9.4	422	1.1
2013	38,486	30,978	80.5	7,508	19.5	3,814	9.9	360	.9
2012	39,201	31,354	80.0	7,847	20.0	3,910	10.0	463	1.2
2011	38,803	30,814	79.4	7,989	20.6	3,862	10.0	374	1.0
2010	39,419	31,447	79.8	7,972	20.2	3,861	9.8	386	1.0
2009	39,525	31,114	78.7	8,411	21.3	4,208	10.6	469	1.2
2008	39,699	31,364	79.0	8,335	21.0	4,361	11.0	506	1.3
2007	39,390	33,160	84.2	6,230	15.8	3,273	8.3	323	.8
2006	39,436	33,279	84.4	6,157	15.6	3,312	8.4	221	.6
2005	39,601	33,404	84.4	6,197	15.6	3,244	8.2	270	.7
2004	39,990	32,967	82.4	7,023	17.6	3,808	9.5	274	.7
2003	40,286	33,575	83.3	6,711	16.7	3,606	9.0	207	.5
2002	38,647	32,267	83.5	6,380	16.5	3,456	8.9	265	.7
2001	38,330	32,141	83.9	6,189	16.1	3,225	8.4	211	.6
2000	38,113	31,942	83.8	6,171	16.2	3,282	8.6	255	.7
1999	37,884	32,290	85.2	5,594	14.8	3,089	8.2	219	.6
1998	38,036	31,335	82.4	6,701	17.6	3,627	9.5	331	.9
Children (by food security status of household): ⁴									
2016	73,829	60,891	82.5	12,938	17.5	6,519	8.8	703	1.0
2015	73,455	60,337	82.1	13,118	17.9	6,377	8.7	541	.7
2014	73,368	58,045	79.1	15,323	20.9	7,949	10.8	914	1.2
2013	73,634	57,862	78.6	15,772	21.4	8,585	11.7	765	1.0
2012	73,631	57,733	78.4	15,898	21.6	8,290	11.3	977	1.3
2011	74,508	57,850	77.6	16,658	22.4	8,565	11.5	845	1.1
2010	74,905	58,697	78.4	16,208	21.6	8,458	11.3	976	1.3
2009	74,207	57,010	76.8	17,197	23.2	8,957	12.1	988	1.3
2008	74,106	57,433	77.5	16,673	22.5	9,098	12.3	1,077	1.5
2007	73,575	61,140	83.1	12,435	16.9	6,766	9.2	691	.9
2006	73,587	60,959	82.8	12,628	17.2	7,065	9.6	430	.6
2005	73,604	61,201	83.1	12,403	16.9	6,718	9.1	606	.8
2004	73,039	59,171	81.0	13,868	19.0	7,823	10.7	545	.7
2003	72,969	59,704	81.8	13,265	18.2	7,388	10.1	420	.6
2002	72,542	59,415	81.9	13,127	18.1	7,397	10.2	567	.8
2001	72,321	59,620	82.4	12,701	17.6	6,866	9.5	467	.6
2000	71,763	58,867	82.0	12,896	18.0	7,018	9.8	562	.8
1999	71,418	59,344	83.1	12,074	16.9	6,996	9.8	511	.7
1998	71,282	57,255	80.3	14,027	19.7	7,840	11.0	716	1.0

¹Totals exclude households for which food security status is unknown because they did not give a valid response to any of the questions in the food security scale. In 2016, these exclusions represented 84,000 households with children (0.2 percent of all households with children).

²Food-insecure households are those with low or very low food security among adults or children or both.

³In some food-insecure households with children, only adults were food insecure. Households with food-insecure children are those with low or very low food security among children.

⁴The food security survey measures food security status at the household level. Not all children residing in food-insecure households were directly affected by the households' food insecurity. Similarly, not all children in households classified as having very low food security among children were subject to the reductions in food intake and disruptions in eating patterns that characterize this condition. Young children, in particular, are often protected from effects of the households' food insecurity.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey Food Security Supplement.

When Food Insecurity Occurs in U.S. Households, It Is Usually Recurrent But Not Chronic

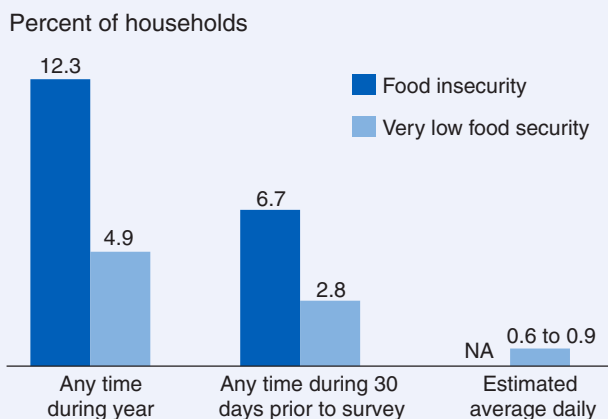
When households experience very low food security in the United States, the resulting instances of reduced food intake and disrupted eating patterns are usually occasional or episodic but are not usually chronic. The food security measurement methods used in this report are designed to register these occasional or episodic occurrences. The questions used to assess households' food security status ask whether a condition, experience, or behavior occurred at any time in the past 12 months, and households can be classified as having very low food security based on a single, severe episode during the year. It is important to keep this aspect of the measure in mind when interpreting food insecurity statistics. Analyses of additional information collected in the food security survey on how frequently various food-insecure conditions occurred during the year, whether they occurred during the 30 days prior to the survey, and, if so, in how many days, provide insight into the frequency and duration of food insecurity in U.S. households. These analyses reveal that in 2016:

- About one-fourth of the households with very low food security at any time during the year experienced the associated conditions rarely or occasionally—in only 1 or 2 months of the year. For three-fourths of households, the conditions were recurrent, experienced in 3 or more months of the year.
- For about one-fourth of food-insecure households and one-third of those with very low food security, occurrence of the associated conditions was frequent or chronic. That is, the conditions occurred often, or in almost every month.
- On average, households that were food insecure at some time during the year were food insecure in 7 months during the year. During the 30-day period ending in mid-December 2016, 8.5 million households (6.7 percent of all households) were food insecure—about 54 percent of the number that were food insecure at any time during the year (see Statistical Supplement table S-4; Coleman-Jensen et al., 2017).
- Similarly, households with very low food security at some time during the year experienced the associated conditions, on average, in 7 months during the year. During the 30-day period ending in mid-December 2016, 3.6 million households (2.8 percent of all households) had very low food security—about 58 percent of the number with very low food security at some time during the year (see Statistical Supplement table S-4).

- Most households that had very low food security at some time during a month experienced the associated conditions in 1 to 7 days of the month. The average daily prevalence of very low food security during the 30-day period ending in mid-December 2016 was probably between 0.8 million and 1.2 million households (0.6 to 0.9 percent of all households)—about 13 to 19 percent of the annual prevalence.
- The daily prevalence of very low food security among children during the 30-day period ending in mid-December 2016 was probably between 47,000 and 57,000 households (0.12 to 0.15 percent of households with children)—about 16 to 19 percent of the annual prevalence.
- The omission of homeless families and individuals from these daily statistics biases the statistics downward, and the bias may be substantial relative to the estimates, especially for the most severe conditions.

(Statistical Supplement tables S-7 to S-9 provide information on how often conditions indicating food insecurity occurred, as reported by respondents to the December 2016 food security survey. See Nord et al., 2000, for more information about the frequency of food insecurity. See Ryu and Bartfeld, 2012, and Wilde et al., 2010, for more information about longer term patterns of food insecurity.)

Prevalence of food insecurity and very low food security, by reference period (2016)



NA = Estimated average daily occurrence of food insecurity is not available because information was not collected on the number of days that less severe food-insecure conditions occurred.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

continued through 2016. Over the previous decade, food insecurity had increased from 10.7 percent in 2001 to nearly 12 percent in 2004, declined to 11 percent in 2005-07, then increased in 2008 (to 14.6 percent), and remained essentially unchanged at that level in 2009 and 2010 (fig. 3).

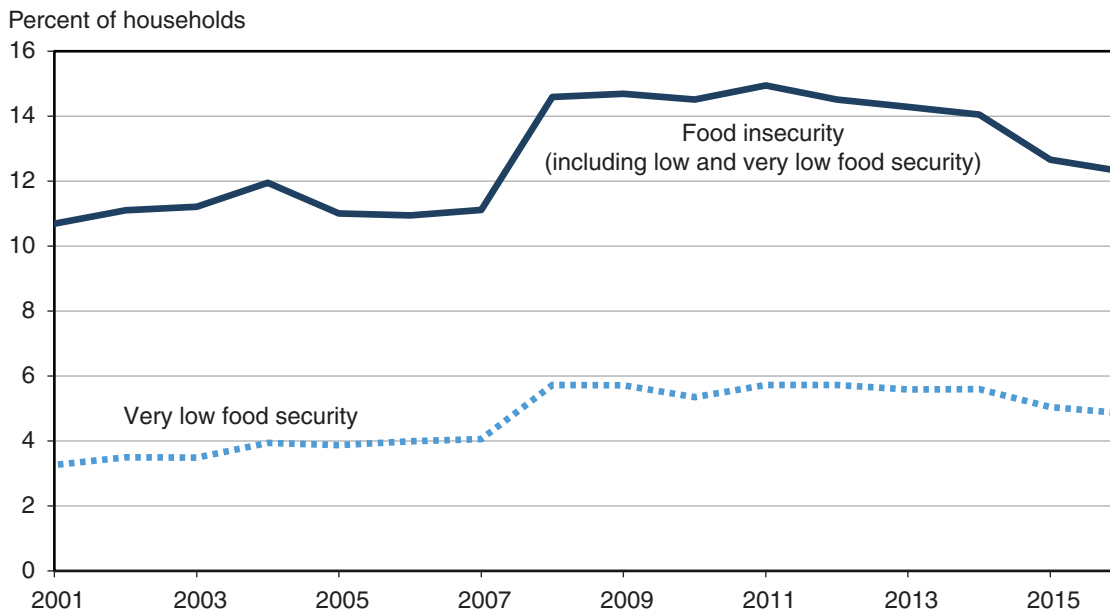
Very low food security was essentially unchanged from 5.0 percent in 2015 to 4.9 percent in 2016. The decline in very low food security from 5.6 percent in 2014 to 5.0 percent in 2015 was statistically significant. However, the prevalence of very low food security was essentially unchanged from 2011 (5.7 percent) through 2014 (5.6 percent). The prevalence of very low food security was also 5.7 percent in 2008 and 2009. In 2010, the prevalence of very low food security had declined to 5.4 percent. Prior to 2008, the prevalence of very low food security had increased from 3.3 percent in 2001 to 3.9 percent in 2004 and remained essentially unchanged through 2007.

Prevalence of Food Insecurity by Selected Household Characteristics

The prevalence of food insecurity varied considerably among households with different demographic and economic characteristics (table 2). Differences in food security across demographic and geographic groups reflect, in part, differences in income across those groups; though no adjustment is made for income in the statistics presented in this report, food insecurity was strongly associated with income. For example, 38.3 percent of households with annual incomes below the official poverty line (household income-to-poverty ratio under 1.00) were food insecure, compared with 5.6 percent of those with incomes at or above 185 percent of the poverty line.¹¹

Figure 3

Trends in the prevalence of food insecurity and very low food security in U.S. households, 2001-2016



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey Food Security Supplement.

¹¹The Federal poverty line was \$24,339 for a family of four (two adults and two children) in 2016.

Rates of food insecurity were below the national average of 12.3 percent for married-couple families with children (9.9 percent), households with more than one adult and no children (8.0 percent), households with elderly persons (7.8 percent), and elderly living alone (8.9 percent).¹² The prevalence of food insecurity was also below the national average for White, non-Hispanic households (9.3 percent); households headed by non-Hispanics of other, or multiple, races (10.7 percent); and households with incomes above 185 percent of the poverty line (5.6 percent).

Rates of food insecurity were higher than the national average for the following groups:

- All households with children (16.5 percent)¹³
- Households with children under age 6 (16.6 percent)
- Households with children headed by a single woman (31.6 percent) or a single man (21.7 percent)¹⁴ and other households with children (22.2 percent)
- Women living alone (13.9 percent) and men living alone (14.3 percent)
- Households headed by Black non-Hispanics (22.5 percent) and Hispanics (18.5 percent)
- Low-income households with incomes below 185 percent of the poverty threshold (31.6 percent).

Across the metropolitan area classifications, the prevalence of food insecurity was higher for households located in nonmetropolitan (rural) areas (15.0 percent) and for those in principal cities of metropolitan areas (14.2 percent), and was lower in suburbs or exurbs and other metropolitan areas outside principal cities (9.5 percent).¹⁵ Regionally, the prevalence of food insecurity was highest in the South (13.5 percent). The prevalence of food insecurity was significantly lower in the Northeast (10.8 percent) than in the Midwest (12.2 percent) or the South, but not statistically different from the West (11.5 percent).

In addition to estimating the prevalence of food insecurity across characteristics, the share that each group contributes to the population of food-insecure households can also be calculated from the statistics in table 2. Among all food-insecure households in 2016, 19.9 percent were female-headed households with children and 15.9 percent were married-couple households with children. About 59

¹²“Elderly” in this report refers to persons ages 65 and older.

¹³About 40 percent of the difference in food insecurity between households with and without children results from a difference in the measures applied to the two types of households. Responses to questions about children as well as adults are considered in assessing the food security status of households with children, but for both types of households, a total of three indications of food insecurity is required for classification as food insecure. Even with the child-referenced questions omitted from the scale, however, in 2016, 14.0 percent of households with children would be classified as food insecure (that is, as having food insecurity among adults), compared with 10.5 percent for households without children. Comparisons of very low food security are not biased substantially by this measurement issue because a higher threshold is applied to households with children, consistent with the larger number of questions taken into consideration (Nord and Coleman-Jensen, 2014).

¹⁴Some households with children headed by a single woman or a single man as classified for these analyses included other adults, who may have been parents, siblings, cohabiting partners, adult children, or other relatives of the reference person or unrelated roomers or boarders.

¹⁵Revised metropolitan statistical areas (MSAs) and principal cities within them were delineated by the Office of Management and Budget in 2013, based on revised standards developed by the U.S. Census Bureau in collaboration with other Federal agencies. The revised delineations were implemented beginning with the 2014 Current Population Survey Food Security Supplement. Food security prevalence statistics by area of residence for 2014 and 2015 are comparable, but are not precisely comparable with corresponding statistics from earlier years. Principal cities include the incorporated areas of the largest city in each MSA and other cities in the MSA that meet specified criteria based on population size and commuting patterns.

Table 2

Households by food security status and selected household characteristics, 2016

Category	Total ¹	Food secure		Food insecure					
				All		With low food security		With very low food security	
				1,000	Percent	1,000	Percent	1,000	Percent
All households	126,401	110,850	87.7	15,551	12.3	9,413	7.4	6,138	4.9
Household composition:									
With children < 18 yrs	38,400	32,059	83.5	6,341	16.5	4,501	11.7	1,840	4.8
With children < 6 yrs	16,571	13,820	83.4	2,751	16.6	1,923	11.6	828	5.0
Married-couple families	25,031	22,560	90.1	2,471	9.9	1,843	7.4	628	2.5
Female head, no spouse	9,780	6,692	68.4	3,088	31.6	2,061	21.1	1,027	10.5
Male head, no spouse	3,070	2,403	78.3	667	21.7	509	16.6	158	5.1
Other household with child ²	519	404	77.8	115	22.2	NA	NA	NA	NA
With no children < 18 yrs	88,001	78,792	89.5	9,209	10.5	4,911	5.6	4,298	4.9
More than one adult	52,353	48,162	92.0	4,191	8.0	2,411	4.6	1,780	3.4
Women living alone	19,649	16,910	86.1	2,739	13.9	1,420	7.2	1,319	6.7
Men living alone	15,999	13,719	85.7	2,280	14.3	1,080	6.8	1,200	7.5
With elderly	36,335	33,496	92.2	2,839	7.8	1,786	4.9	1,053	2.9
Elderly living alone	13,529	12,326	91.1	1,203	8.9	733	5.4	470	3.5
Race/ethnicity of households:									
White, non-Hispanic	84,087	76,271	90.7	7,816	9.3	4,591	5.5	3,225	3.8
Black, non-Hispanic	15,940	12,346	77.5	3,594	22.5	2,048	12.8	1,546	9.7
Hispanic ³	17,054	13,907	81.5	3,147	18.5	2,152	12.7	995	5.8
Other, non-Hispanic	9,319	8,325	89.3	994	10.7	622	6.7	372	4.0
Household income-to-poverty ratio:									
Under 1.00	13,929	8,598	61.7	5,331	38.3	2,920	21.0	2,411	17.3
Under 1.30	18,522	11,917	64.3	6,605	35.7	3,725	20.2	2,880	15.5
Under 1.85	29,025	19,860	68.4	9,165	31.6	5,319	18.3	3,846	13.3
1.85 and over	67,785	64,001	94.4	3,784	5.6	2,499	3.7	1,285	1.9
Income unknown	29,590	26,988	91.2	2,602	8.8	1,595	5.4	1,007	3.4
Area of residence: ⁴									
Inside metropolitan area	108,118	95,315	88.2	12,803	11.8	7,868	7.2	4,935	4.6
In principal cities ⁵	37,176	31,879	85.8	5,297	14.2	3,117	8.3	2,180	5.9
Not in principal cities	54,399	49,222	90.5	5,177	9.5	3,286	6.0	1,891	3.5
Outside metropolitan area	18,283	15,535	85.0	2,748	15.0	1,545	8.4	1,203	6.6
Census geographic region:									
Northeast	22,669	20,217	89.2	2,452	10.8	1,594	7.0	858	3.8
Midwest	27,307	23,976	87.8	3,331	12.2	1,871	6.9	1,460	5.3
South	47,966	41,476	86.5	6,490	13.5	3,890	8.1	2,600	5.4
West	28,458	25,180	88.5	3,278	11.5	2,057	7.2	1,221	4.3

NA = Not reported; fewer than 10 households in the survey with this characteristic had very low food security.

¹Totals exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale. In 2016, these exclusions represented 408,000 households (0.3 percent of all households).

²Households with children in complex living arrangements, e.g., children of other relatives or unrelated roommate or boarder.

³Hispanics may be of any race.

⁴Metropolitan area residence is based on 2013 Office of Management and Budget delineation. Prevalence rates by area of residence are comparable with those for 2014 and 2015 but are not precisely comparable with those of earlier years.

⁵Households within incorporated areas of the largest cities in each metropolitan area. Residence inside or outside of principal cities is not identified for about 15 percent of households in metropolitan statistical areas.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

percent of all food-insecure households were adult-only households with no children. Low-income households with incomes below 185 percent of poverty made up the majority of food-insecure households, 58.9 percent. Households with incomes at or above 185 percent of poverty made up about one-quarter of all food-insecure households in 2016.

The prevalence of very low food security in various types of households followed a pattern similar to that observed for food insecurity. Percentages were lower than the national average of 4.9 percent for married couples with children (2.5 percent); multiple-adult households with no children (3.4 percent); households with elderly persons (2.9 percent); elderly living alone (3.5 percent); White, non-Hispanic households (3.8 percent); households headed by non-Hispanics of other, or multiple, races (4.0 percent); households with incomes above 185 percent of the poverty line (1.9 percent); households in suburbs and exurbs outside principal cities within metropolitan areas (3.5 percent); and households in the Northeast (3.8 percent) and West (4.3 percent).

The prevalence of very low food security was significantly higher than the national average (4.9 percent) for the following groups:

- Households with children headed by a single woman (10.5 percent)
- Women living alone (6.7 percent) and men living alone (7.5 percent)
- Black, non-Hispanic households (9.7 percent) and Hispanic households (5.8 percent)
- Households with incomes below 185 percent of the poverty line (13.3 percent)
- Households located in principal cities (5.9 percent) and in nonmetropolitan areas (6.6 percent)
- Households in the South (5.4 percent).

In 8.0 percent of households with children, one or more child was food insecure (table 3).¹⁶ Among household categories, the percentage of households with food-insecure children was lower in married-couple households (4.7 percent); White, non-Hispanic households (5.6 percent); households with incomes above 185 percent of the poverty line (2.5 percent); and metropolitan households located in suburbs and exurbs outside of principal cities (6.5 percent). The percentage of households with food-insecure children was higher for female-headed households (16.0 percent); Black, non-Hispanic households (13.4 percent); Hispanic households (11.6 percent); low-income households with incomes below 185 percent of the poverty line (18.2 percent); households in principal cities (9.4 percent); and households in nonmetropolitan areas (10.5 percent).

Compared with the prevalence for all households with children (0.8 percent), very low food security among children was less prevalent in married-couple families (0.4 percent); in White, non-Hispanic households (0.4 percent); and in households located outside principal cities in metropolitan areas (0.4 percent). Very low food security among children was more prevalent in households headed by a single woman (1.7 percent); households headed by a Black, non-Hispanic adult (2.2 percent); households with incomes below 185 percent of the poverty line (2.0 percent); and households located in principal cities (1.4 percent).

¹⁶Households are classified as having food insecurity among children if they report two or more food-insecure conditions among children in response to questions 11-18 in the box on page 3 (Coleman-Jensen et al., 2013; Nord, 2009a).

Table 3

Prevalence of food security and food insecurity in households with children by selected household characteristics, 2016

Category	Total ¹	Food-secure households		Food-insecure households ²		Households with food-insecure children ³		Households with very low food security among children	
		1,000	Percent	1,000	Percent	1,000	Percent	1,000	Percent
All households with children	38,400	32,058	83.5	6,342	16.5	3,069	8.0	298	0.8
Household composition:									
With children < 6 yrs	16,571	13,820	83.4	2,751	16.6	1,318	8.0	121	.7
Married-couple families	25,031	22,560	90.1	2,471	9.9	1,182	4.7	95	.4
Female head, no spouse	9,780	6,693	68.4	3,087	31.6	1,560	16.0	168	1.7
Male head, no spouse	3,070	2,402	78.2	668	21.8	283	9.2	NA	NA
Other household with child ⁴	519	404	77.8	115	22.2	45	8.7	NA	NA
Race/ethnicity of households:									
White, non-Hispanic	21,574	18,838	87.3	2,736	12.7	1,198	5.6	84	.4
Black, non-Hispanic	4,995	3,695	74.0	1,300	26.0	668	13.4	111	2.2
Hispanic ⁵	8,319	6,493	78.1	1,826	21.9	969	11.6	87	1.0
Other, non-Hispanic	3,512	3,032	86.3	480	13.7	234	6.7	NA	NA
Household income-to-poverty ratio:									
Under 1.00	5,533	3,110	56.2	2,423	43.8	1,310	23.7	172	3.1
Under 1.30	7,467	4,426	59.3	3,041	40.7	1,629	21.8	194	2.6
Under 1.85	11,657	7,538	64.7	4,119	35.3	2,120	18.2	232	2.0
1.85 and over	19,477	18,257	93.7	1,220	6.3	485	2.5	NA	NA
Income unknown	7,265	6,263	86.2	1,002	13.8	465	6.4	NA	NA
Area of residence: ⁶									
Inside metropolitan area	33,390	28,071	84.1	5,319	15.9	2,542	7.6	266	.8
In principal cities ⁷	10,855	8,749	80.6	2,106	19.4	1,016	9.4	156	1.4
Not in principal cities	17,672	15,350	86.9	2,322	13.1	1,151	6.5	71	.4
Outside metropolitan area	5,009	3,986	79.6	1,023	20.4	527	10.5	32	.6
Census geographic region:									
Northeast	6,370	5,388	84.6	982	15.4	431	6.8	51	.8
Midwest	7,888	6,651	84.3	1,237	15.7	628	8.0	47	.6
South	14,687	12,135	82.6	2,552	17.4	1,238	8.4	132	.9
West	9,454	7,884	83.4	1,570	16.6	772	8.2	68	.7

NA = Not reported; fewer than 10 households in the survey with this characteristic had very low food security among children.

¹Totals exclude households for which food security status is unknown because they did not give a valid response to any of the questions in the food security scale. In 2016, these exclusions represented 84,000 households with children (0.2 percent of all households with children).

²Food-insecure households are those with low or very low food security among adults or children or both.

³In some food-insecure households with children, only adults were food insecure. Households with food-insecure children are those with low or very low food security among children.

⁴Households with children in complex living arrangements, e.g., children of other relatives or unrelated roommate or boarder.

⁵Hispanics may be of any race.

⁶Metropolitan area residence is based on 2013 Office of Management and Budget delineation. Prevalence rates by area of residence are comparable with those for 2014 and 2015 but are not precisely comparable with those of earlier years.

⁷Households within incorporated areas of the largest cities in each metropolitan area. Residence inside or outside of principal cities is not identified for about 15 percent of households with children in metropolitan statistical areas.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

Prevalence rates of food insecurity declined from 2015 to 2016 among White, non-Hispanic-headed households (from 10.0 percent in 2015 to 9.3 percent in 2016) and households living in suburbs and exurbs or the other metropolitan areas outside principal cities (from 10.4 percent in 2015 to 9.5 percent in 2016) (fig. 4). There were no statistically significant increases in food insecurity.

The prevalence of very low food security declined significantly from 2015 to 2016 among single-father families with children (from 8.2 percent in 2015 to 5.1 percent in 2016); White, non-Hispanic-headed households (from 4.3 percent in 2015 to 3.8 percent in 2016); households living in suburban and exurban areas (from 4.2 percent in 2015 to 3.5 percent in 2016); and in the Northeast (from 4.7 percent in 2015 to 3.8 percent in 2016) (fig. 5). There was a statistically significant increase in very low food security for Black, non-Hispanic-headed households (from 7.9 percent in 2015 to 9.7 percent in 2016).

Prevalence of Food Insecurity by State

The prevalence of food insecurity varied considerably from State to State. In addition to household-level characteristics such as income, employment, and household structure, the prevalence of food security is also affected by State-level characteristics such as average wages, cost of housing, and participation in nutrition assistance programs (Bartfeld et al., 2006). Prevalence rates for 3 years, 2014-16, were averaged to provide more reliable statistics at the State level (table 4). Estimated prevalence rates of food insecurity during this 3-year period ranged from 8.7 percent in Hawaii to 18.7 percent in Mississippi; estimated prevalence rates of very low food security ranged from 3.0 percent in Hawaii and Delaware to 7.7 percent in Alabama and Louisiana.¹⁷

The margin of error for the State prevalence rates should be taken into consideration when interpreting these statistics, especially when comparing prevalence rates across States. The margin of error reflects sampling variation—the uncertainty associated with estimates that are based on information from a limited number of households in each State. The margins of error presented in table 4 indicate the range (above or below the estimated prevalence rate) that is 90 percent likely to include the true prevalence rate. For example, considering the margins of error, it is not certain that the prevalence of very low food security was higher in Alabama and Louisiana than in the States with the next eight highest prevalence rates.

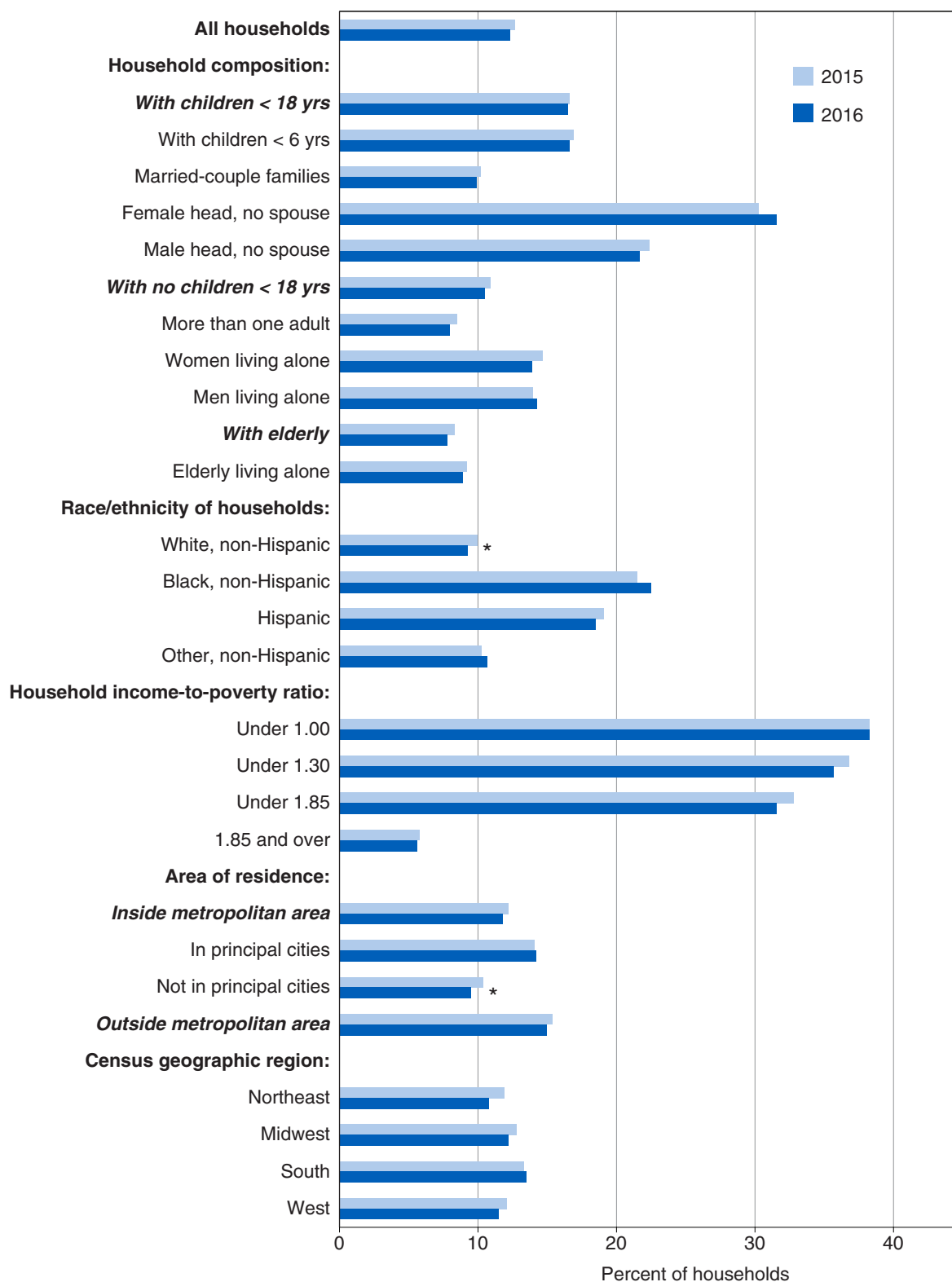
Taking into account margins of error of the State and U.S. estimates, the prevalence of food insecurity was higher (i.e., statistically significantly higher) than the national average in 15 States (AL, AR, AZ, IN, KY, LA, ME, MS, NC, NM, OH, OK, OR, TX, and WV) and lower than the national average in 17 States (CA, CO, DE, FL, HI, IA, IL, MA, MD, MN, ND, NH, NJ, SD, VA, VT, and WI) and the District of Columbia.¹⁸ In the remaining 18 States, differences from the national average were not statistically significant. The prevalence of very low food security was higher than the national average in 12 States (AL, AR, IN, KY, LA, ME, MI, MS, NM, OH, OK, and WV), lower than the national average in 10 States (AK, CA, DE, HI, MD, MN, ND, NH, NJ, and NY) and the District of Columbia, and not significantly different from the national average in 28 States.

¹⁷A map of the States showing the prevalence of food insecurity for 2014-16 is available for download on the ERS website.

¹⁸Standard error of difference assumes that there is no correlation between national and individual State estimates.

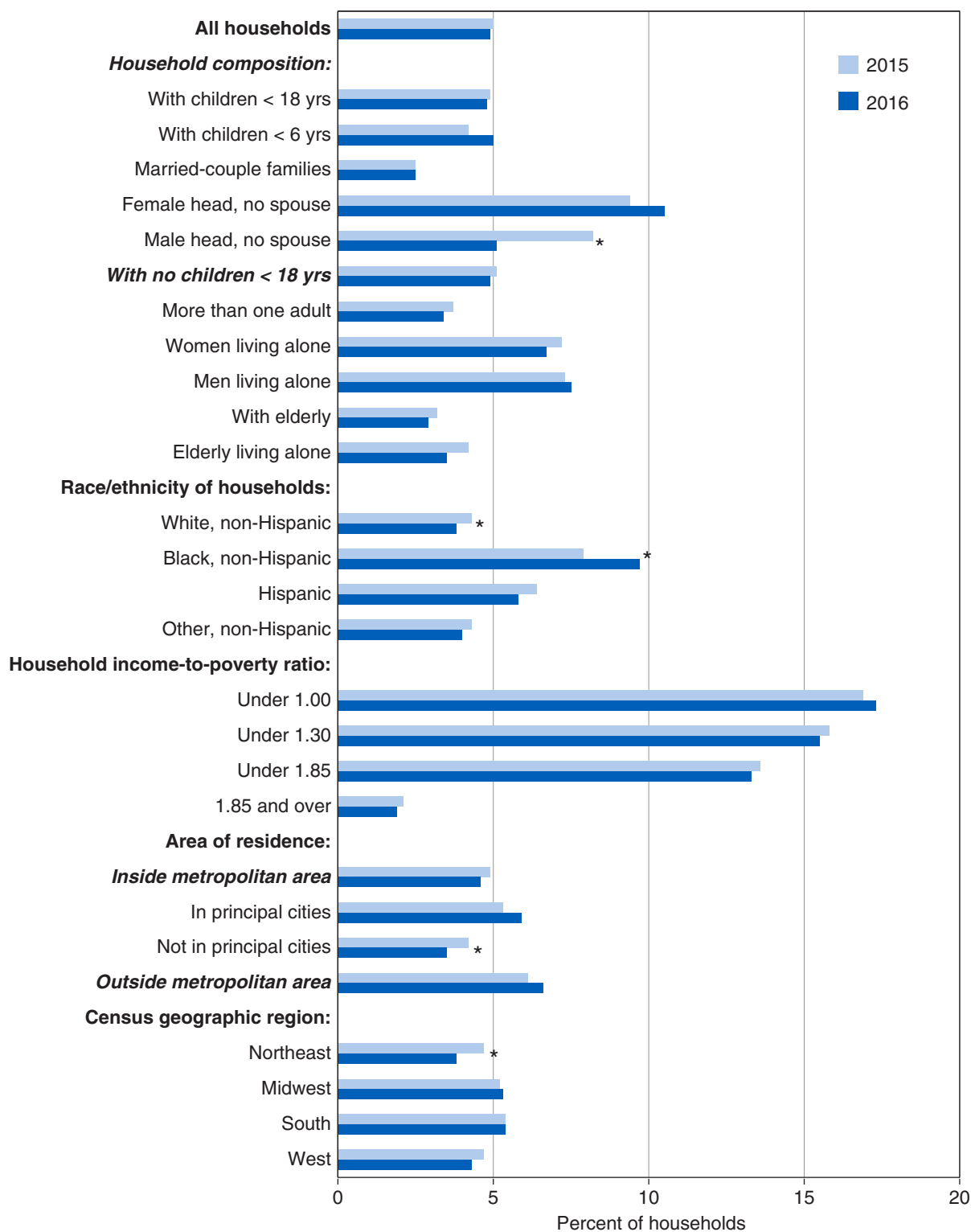
Figure 4

Prevalence of food insecurity, 2015 and 2016



*Change from 2015 to 2016 was statistically significant with 90-percent confidence ($t > 1.645$).
 Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2015 and 2016 Current Population Survey Food Security Supplement.

Figure 5
Prevalence of very low food security, 2015 and 2016



* Change from 2015 to 2016 was statistically significant with 90-percent confidence ($t > 1.645$).
 Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2015 and 2016 Current Population Survey Food Security Supplement.

Table 4

Prevalence of household food insecurity and very low food security by State, 2014-16 average

States	Number of households		Food insecurity (low or very low food security)		Very low food security	
	Average 2014-16 ¹	Interviewed	Prevalence	Margin of error ²	Prevalence	Margin of error ²
	<i>Number</i>	<i>Number</i>	<i>Percent</i>	<i>Percentage points</i>	<i>Percent</i>	<i>Percentage points</i>
U.S.	125,203,000	124,067	13.0	0.21	5.2	0.13
AK	263,000	1,436	12.7	1.56	3.6 *	0.77
AL	1,993,000	2,387	18.1 *	1.86	7.7 *	1.28
AR	1,194,000	2,236	17.5 *	1.65	6.8 *	1.11
AZ	2,648,000	1,874	14.6 *	1.57	5.8	0.98
CA	13,829,000	9,432	11.8 *	0.71	4.1 *	0.38
CO	2,293,000	1,564	10.3 *	1.45	4.3	0.94
CT	1,435,000	1,350	12.3	1.76	6.4	1.44
DC	324,000	2,584	11.4 *	1.08	4.0 *	0.75
DE	388,000	1,489	10.8 *	1.48	3.0 *	0.80
FL	8,194,000	5,160	12.0 *	0.86	4.7	0.54
GA	4,015,000	2,813	14.0	1.17	5.6	0.73
HI	464,000	1,662	8.7 *	1.33	3.0 *	0.63
IA	1,276,000	1,564	10.7 *	1.48	4.6	1.06
ID	634,000	1,812	12.1	1.44	4.3	0.89
IL	5,012,000	3,584	11.1 *	1.10	4.7	0.77
IN	2,640,000	2,097	15.2 *	1.55	6.8 *	1.08
KS	1,183,000	1,697	14.5	1.70	5.5	1.11
KY	1,812,000	1,690	17.3 *	3.14	7.4 *	1.84
LA	1,817,000	2,800	18.3 *	1.50	7.7 *	0.99
MA	2,786,000	2,387	10.3 *	1.21	4.4	0.87
MD	2,303,000	1,723	10.1 *	1.52	3.9 *	0.89
ME	577,000	1,348	16.4 *	2.46	7.4 *	1.92
MI	3,998,000	2,789	14.3	1.62	6.2 *	0.98
MN	2,194,000	1,825	9.7 *	1.49	3.6 *	0.76
MO	2,436,000	1,900	14.2	1.59	6.2	1.01
MS	1,143,000	2,366	18.7 *	1.48	6.9 *	0.73
MT	441,000	2,655	12.9	1.35	5.7	0.81
NC	3,994,000	2,788	15.1 *	1.55	5.7	1.07
ND	320,000	1,980	8.8 *	1.19	3.3 *	0.77
NE	757,000	1,599	14.7	1.86	5.7	1.23
NH	534,000	1,860	9.6 *	1.29	3.8 *	0.86
NJ	3,367,000	2,400	11.1 *	1.38	4.1 *	0.74
NM	817,000	2,191	17.6 *	1.56	6.8 *	1.09
NV	1,138,000	1,708	12.1	1.56	4.7	0.90
NY	7,819,000	4,736	12.5	0.93	4.3 *	0.54
OH	4,704,000	3,440	14.8 *	1.27	6.3 *	0.79
OK	1,567,000	1,874	15.2 *	1.57	6.3 *	1.03
OR	1,602,000	1,823	14.6 *	1.41	6.2	1.24
PA	5,156,000	3,438	12.5	1.29	4.5	0.72
RI	440,000	1,233	12.8	1.89	6.1	1.19
SC	2,004,000	1,969	13.0	1.57	4.9	0.90
SD	349,000	1,470	10.6 *	1.96	4.2	1.08
TN	2,660,000	2,408	13.4	1.24	5.8	0.76
TX	10,023,000	6,240	14.3 *	0.92	5.6	0.60
UT	972,000	1,605	11.5	1.69	4.6	1.09
VA	3,216,000	2,363	9.9 *	1.23	4.8	0.85
VT	260,000	1,879	10.1 *	1.33	4.3	0.92
WA	2,828,000	2,230	11.6	1.46	4.8	0.80
WI	2,385,000	2,093	10.7 *	1.51	4.2	1.13
WV	760,000	2,621	14.9 *	1.73	6.2 *	0.97
WY	234,000	1,895	12.7	1.77	4.9	0.96

*Difference from U.S. average was statistically significant with 90-percent confidence ($t > 1.645$). Standard error of differences assumes that there is no correlation between national and individual State estimates.

¹Totals exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale. These exclusions represented about 0.2 percent of all households in 2014, 0.3 percent in 2015, and 0.3 percent in 2016.

²Margin of error with 90-percent confidence (1.645 times the standard error of the estimated prevalence rate). Standard errors were estimated using balanced repeated replication (BRR) methods based on replicate weights for the CPS Food Security Supplement.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2014, 2015, and 2016 Current Population Survey (CPS) Food Security Supplements.

State-level prevalence rates of food insecurity and very low food security for the period 2014-16 are compared with 3-year average rates for 2011-13 and 2004-06 in table 5. The prevalence rates for 2014-16 are repeated from table 4. The prevalence rates for the immediate 3-year period, 2011-13, were reported previously in *Household Food Security in the United States in 2013* (Coleman-Jensen et al., 2014). The 2004-06 prevalence rates were reported previously in *Household Food Security in the United States, 2006* (Nord et al., 2007) and are presented as a baseline to assess changes in State-level food security conditions over the past decade.¹⁹

There was a statistically significant percentage-point increase in the prevalence of food insecurity from 2011-13 to 2014-16 in 1 State (NM), and food insecurity declined significantly in 16 States (AR, CA, CO, FL, GA, HI, ID, MD, MO, NV, NY, TN, TX, UT, VT, and WA). During the same period, the prevalence of very low food security increased significantly in two States (LA and RI) and declined significantly in nine States (CA, DE, FL, HI, ID, MO, NV, NY, and VT). There was a statistically significant percentage point increase in the prevalence of food insecurity from 2004-06 to 2014-16 in 27 States, and food insecurity declined significantly in 2 States (TX and UT). The prevalence of very low food security increased significantly from 2004-06 to 2014-16 in 29 States, and very low food security declined significantly in 1 State (AK). Changes not marked as statistically significant (*) in table 5 were within ranges that could have resulted from sampling variation (that is, a non-zero difference between sample estimates, based on the households that happen to be chosen for the sample, which is consistent with no actual change in food security in the State's general population).

¹⁹Prevalence rates for 1996-98 reported in *Prevalence of Food Insecurity and Hunger, by State, 1996-1998* (Nord et al., 1999) are not directly comparable with the rates reported here because of differences in screening procedures in the CPS Food Security Supplements from 1995 to 1998. Statistics for 1996-1998 adjusted to be comparable with those for recent years are presented in *Statistical Supplement to Food Security in the United States in 2010*, table S-4 (Coleman-Jensen et al., 2011). Standard errors of State-level estimates for 2003-05 were calculated using jackknife replication methods with "month-in-sample" groups considered as separate independent samples (see Nord et al., 1999).

Table 5

Change in prevalence of household food insecurity and very low food security by State averages, 2014-16, 2011-13 , and 2004-06¹

States	Food insecurity (low or very low food security)					Very low food security				
	Average	Average	Average	Change	Change	Average	Average	Average	Change	Change
	2014-16	2011-13	2004-06	to	to	2014-16	2011-13	2004-06	to	to
	Percent			Percentage points		Percent			Percentage points	
U.S.	13.0	14.6	11.3	-1.6*	1.7*	5.2	5.7	3.9	-0.5*	1.3*
AK	12.7	11.8	12.6	.9	.1	3.6	4.5	5.1	-.9	-1.5*
AL	18.1	16.7	12.1	1.4	6.0*	7.7	7.0	3.3	.7	4.4*
AR	17.5	21.2	14.3	-3.7*	3.2*	6.8	8.4	5.8	-1.6	1.0
AZ	14.6	15.6	13.1	-1.0	1.5	5.8	6.3	4.3	-.5	1.5*
CA	11.8	15.0	10.9	-3.2*	.9	4.1	5.6	3.7	-1.5*	.4
CO	10.3	13.9	12.0	-3.6*	-1.7	4.3	5.5	4.4	-1.2	-.1
CT	12.3	13.4	8.6	-1.1	3.7*	6.4	5.0	2.7	1.4	3.7*
DC	11.4	13.4	12.5	-2.0	-1.1	4.0	5.2	3.8	-1.2	.2
DE	10.8	12.9	7.8	-2.1	3.0*	3.0	5.1	2.6	-2.1*	.4
FL	12.0	14.1	8.9	-2.1*	3.1*	4.7	5.9	3.1	-1.2*	1.6*
GA	14.0	16.6	12.6	-2.6*	1.4	5.6	6.0	5.0	-.4	.6
HI	8.7	12.9	7.8	-4.2*	.9	3.0	4.7	2.8	-1.7*	.2
IA	10.7	11.9	11.4	-1.2	-.7	4.6	4.4	3.9	.2	.7
ID	12.1	15.1	12.7	-3.0*	-.6	4.3	5.9	3.5	-1.6*	.8
IL	11.1	12.5	9.8	-1.4	1.3	4.7	4.4	3.5	.3	1.2*
IN	15.2	14.1	10.8	1.1	4.4*	6.8	6.1	4.0	.7	2.8*
KS	14.5	15.2	12.5	-.7	2.0*	5.5	6.0	4.5	-.5	1.0
KY	17.3	16.4	13.6	.9	3.7*	7.4	6.7	4.6	.7	2.8*
LA	18.3	16.5	14.4	1.8	3.9*	7.7	5.5	5.0	2.2*	2.7*
MA	10.3	10.6	8.1	-.3	2.2*	4.4	3.9	3.0	.5	1.4*
MD	10.1	13.3	9.5	-3.2*	.6	3.9	4.9	3.9	-1.0	.0
ME	16.4	15.1	12.9	1.3	3.5*	7.4	7.1	5.3	.3	2.1*
MI	14.3	13.9	12.2	.4	2.1*	6.2	5.7	4.6	.5	1.6*
MN	9.7	10.8	8.2	-1.1	1.5	3.6	4.4	3.2	-.8	.4
MO	14.2	16.9	12.3	-2.7*	1.9	6.2	8.1	4.4	-1.9*	1.8*
MS	18.7	21.1	18.1	-2.4	.6	6.9	7.2	6.4	-.3	.5
MT	12.9	11.8	9.9	1.1	3.0*	5.7	4.9	4.3	.8	1.4*
NC	15.1	17.3	12.9	-2.2	2.2*	5.7	6.3	4.4	-.6	1.3*
ND	8.8	8.7	6.4	.1	2.4*	3.3	3.1	2.2	.2	1.1*
NE	14.7	13.8	9.5	.9	5.2*	5.7	5.2	3.8	.5	1.9*
NH	9.6	10.2	7.4	-.6	2.2*	3.8	4.6	2.2	-.8	1.6*
NJ	11.1	11.4	7.7	-.3	3.4*	4.1	4.8	2.1	-.7	2.0*
NM	17.6	13.2	16.1	4.4*	1.5	6.8	5.1	5.8	1.7	1.0
NV	12.1	16.2	8.8	-4.1*	3.3*	4.7	6.9	3.2	-2.2*	1.5*
NY	12.5	14.0	9.8	-1.5*	2.7*	4.3	5.2	3.2	-.9*	1.1*
OH	14.8	16.0	12.7	-1.2	2.1*	6.3	7.2	4.1	-.9	2.2*
OK	15.2	15.5	14.6	-.3	.6	6.3	6.7	5.3	-.4	1.0
OR	14.6	15.2	11.9	-.6	2.7*	6.2	6.1	4.4	.1	1.8*
PA	12.5	11.9	10.0	.6	2.5*	4.5	4.8	3.3	-.3	1.2*
RI	12.8	14.4	11.3	-1.6	1.5	6.1	4.6	3.7	1.5*	2.4*
SC	13.0	14.1	14.7	-1.1	-1.7	4.9	5.3	5.9	-.4	-1.0
SD	10.6	12.6	9.5	-2.0	1.1	4.2	4.6	3.3	-.4	.9
TN	13.4	17.4	12.5	-4.0*	.9	5.8	7.0	4.3	-1.2	1.5*
TX	14.3	18.0	15.9	-3.7*	-1.6*	5.6	6.3	5.3	-.7	.3
UT	11.5	14.3	14.5	-2.8*	-3.0*	4.6	4.6	5.1	.0	-.5
VA	9.9	9.5	7.9	.4	2.0*	4.8	3.8	2.8	1.0	2.0*
VT	10.1	13.2	9.6	-3.1*	.5	4.3	6.1	4.3	-1.8*	.0
WA	11.6	14.3	10.3	-2.7*	1.3	4.8	5.6	3.6	-.8	1.2*
WI	10.7	11.6	8.9	-.9	1.8*	4.2	5.0	2.7	-.8	1.5*
WV	14.9	14.4	9.3	.5	5.6*	6.2	5.1	3.2	1.1	3.0*
WY	12.7	14.6	10.6	-1.9	2.1*	4.9	5.5	3.7	-.6	1.2

*Change was statistically significant with 90-percent confidence ($t > 1.645$).

¹Percentages exclude households for which food security status is unknown because household respondents did not give a valid response to any of the questions in the food security scale.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey Food Security Supplements.

Household Spending on Food

This section provides information on how much households spent on food, as reported in the December 2016 food security survey. Food insecurity is a condition that arises from lack of money and other resources to acquire food. In most households, the majority of food consumed by household members is purchased, either from supermarkets or grocery stores—to be prepared and eaten at home—or from cafeterias, restaurants, or vending machines to be eaten outside the home. The amount of money a household spends on food thus provides insight into how adequately the household is meeting its food needs.²⁰ When a household reduces food spending below some minimum level, such as USDA’s Thrifty Food Plan, because of constrained resources, aspects of food insecurity such as disrupted eating patterns and reduced food intake may result.

Methods

The household food expenditure statistics in this report are based on usual weekly spending for food, as reported by respondents after they were given a chance to reflect on the household’s actual food spending during the previous week. Respondents were first asked to report the amounts of money their households had spent on food in the week prior to the interview, including any purchases made with SNAP benefits (formerly called food stamps) at:

- supermarkets and grocery stores;
- stores other than supermarkets and grocery stores, such as meat markets, produce stands, bakeries, warehouse clubs, and convenience stores;
- restaurants, fast food places, cafeterias, and vending machines; and
- “...any other kind of place.”²¹

Total spending for food, based on responses to this series of questions, was verified with the respondent, and the respondent was then asked how much the household usually spent on food during a week.²² Analyses by ERS researchers have found that usual food expenditures estimated from data collected by this method were consistent with estimates from the Consumer Expenditure Survey (CES)—the principal source of data on U.S. household expenditures for goods and services (Oliveira and Rose, 1996; Nord, 2009b).

²⁰Food spending is only an indirect indicator of food consumption. It understates food consumption in households that receive food from in-kind programs, such as the National School Lunch and School Breakfast Programs, WIC, meal programs for children in childcare and for the elderly, and private charitable organizations. (Purchases with SNAP benefits, however, are counted as food spending in the CPS food security survey.) Food spending also understates food consumption in households that acquire a substantial part of their food supply through gardening, hunting, or fishing, as well as in households that obtain groceries from friends or relatives or eat more meals at friends’ or relatives’ homes than they provide to friends or relatives. Food spending also understates food consumption in geographical areas with relatively low food prices and overstates consumption in areas with high food prices.

²¹For spending in the first two categories of stores, respondents were also asked how much of the amount was for “nonfood items such as pet food, paper products, alcohol, detergents, or cleaning supplies.” These amounts are subtracted from total spending at each of these stores to arrive at spending for food.

²²Beginning with the 2015 Current Population Survey Food Security Supplement, food-spending amounts are categorized in public-use data. Categorizing the dollar amounts reduces the risk of disclosure and is now standard for data collected by the U.S. Census Bureau. ERS analysis suggests that this change has little effect on the estimates of median food spending reported here, which use the categorical food-spending data and are not precisely comparable with estimates published in previous annual food security reports. Changes in food spending from 2015 described in the text are based on comparable estimates of 2015 categorical food-spending data.

Food spending was adjusted for household size and composition in two ways. The first adjustment was calculated by dividing each household's usual weekly food expenditure by the number of persons in the household, yielding the "usual weekly food spending per person" for that household. The second adjustment accounts more precisely for the different food needs of households by comparing each household's usual food spending to the estimated cost of the Thrifty Food Plan for that household in December 2016.²³ The Thrifty Food Plan (TFP)—developed by USDA—serves as a national standard for a nutritious, minimal-cost diet. It represents a set of "market baskets" of food that people in specific age and gender categories could consume at home to maintain a healthful diet that meets current dietary standards, taking into account the food consumption patterns of U.S. households (U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, 2007).²⁴ Each household's reported usual weekly food spending was divided by the household-specific cost of the TFP, based on the age and gender of each household member and the number of persons in the household (U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, 2016).²⁵

The medians of each of the two food-spending measures (spending per person per week and spending relative to the cost of the TFP) were estimated at the national level and for households in various categories to represent the usual weekly food spending of the typical household in each category. Medians are reported rather than averages (means) because medians are not unduly affected by the few unexpectedly high values of usual food spending that are believed to be reporting or data entry errors. Thus, the median better reflects what a typical household spent.

About 7.7 percent of households interviewed in the CPS food security survey did not respond to the food-spending questions or reported zero usual food spending and were excluded from the analysis. As a result, the total number of households represented in tables 6 and 7 is somewhat smaller than that in tables 1 and 2, and food-spending estimates may not be fully representative of all households in the United States.²⁶

Food Expenditures by Selected Household Characteristics

In 2016, the typical U.S. household spent \$50.00 per person each week for food (table 6). Median household food spending relative to the cost of the TFP—which adjusts for food price inflation and adjusts more precisely for the food needs of persons in different age-gender categories—was 1.22, up from 1.18 in 2015 (Coleman-Jensen et al., 2016). That is, in 2016, the typical household spent 22 percent more on food than the cost of the TFP for that household.

Households with children under age 18 generally spent less for food, relative to the cost of the TFP, than those without children. The typical household with children spent 12 percent more than the cost of the TFP on food, while the typical household with no children spent 32 percent more than the cost of the TFP. Median food expenditures relative to the cost of the TFP were lower for households

²³The cost of the TFP is revised each month to account for inflation in food prices. For this report, TFP costs are estimated by ERS separately for Alaska and Hawaii, using adjustment factors calculated from USDA's TFP costs for those States for the second half of 2016.

²⁴The TFP, in addition to its use as a research tool, is used as a basis for setting the maximum SNAP benefit amounts.

²⁵The cost of a TFP for a household is calculated under the assumption that all household members purchase and prepare food together.

²⁶Households that were unable or unwilling to report food spending were less likely to be food insecure than those that did report food spending (8.1 percent compared with 12.7 percent). Food spending may, therefore, be slightly underestimated from these data.

Table 6

Weekly household food spending per person and relative to the cost of the Thrifty Food Plan (TFP), 2016

Category	Number of households ¹	Median weekly food spending	
		Per person	Relative to cost of TFP
	<i>1,000</i>	<i>Dollars</i>	<i>Ratio</i>
All households	115,482	50.00	1.22
Household composition:			
With children < 18 yrs	35,965	40.00	1.12
At least one child < 6 yrs	15,587	37.50	1.14
Married-couple families	23,570	40.00	1.17
Female head, no spouse	9,137	36.67	1.03
Male head, no spouse	2,760	40.00	1.07
Other household with child ²	498	33.33	.97
With no children < 18 yrs	79,517	60.00	1.32
More than one adult	47,876	50.00	1.21
Women living alone	17,327	60.00	1.35
Men living alone	14,315	80.00	1.58
With elderly	32,129	50.00	1.20
Elderly living alone	11,605	60.00	1.30
Race/ethnicity of households:			
White, non-Hispanic	77,356	50.00	1.32
Black, non-Hispanic	14,264	43.33	1.08
Hispanic ³	15,477	43.33	1.13
Other, non-Hispanic	8,384	50.00	1.21
Household income-to-poverty ratio:			
Under 1.00	12,647	40.00	.96
Under 1.30	16,954	40.00	.96
Under 1.85	26,935	40.00	1.01
1.85 and over	64,560	56.67	1.38
Income unknown	23,987	50.00	1.20
Area of residence: ⁴			
Inside metropolitan area	98,511	50.00	1.26
In principal cities ⁵	33,403	50.00	1.28
Not in principal cities	49,878	50.00	1.29
Outside metropolitan area	16,971	50.00	1.14
Census geographic region:			
Northeast	20,171	50.00	1.31
Midwest	25,163	50.00	1.20
South	43,923	50.00	1.21
West	26,224	50.00	1.26

Note: These estimates are based on categorical food spending data rather than on continuous data that were used in previous years. Beginning with the 2015 Current Population Survey Food Security Supplement, food spending amounts are categorized in public-use data. ERS analysis suggests that this change has little effect on the estimates of median food spending reported here.

¹Totals exclude households that did not answer the questions about spending on food or reported zero usual food spending. These exclusions represented 8.9 percent of all households.

²Households with children in complex living arrangements, e.g., children of other relatives or unrelated roommate or boarder.

³Hispanics may be of any race.

⁴Metropolitan area residence is based on 2013 Office of Management and Budget delineation.

⁵Households within incorporated areas of the largest cities in each metropolitan area. Residence inside or outside of principal cities is not identified for about 15 percent of households in metropolitan statistical areas.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

with children headed by single women (1.03), single men (1.07), or other households with children (0.97) than for married couples with children (1.17). Food spending relative to the cost of the TFP below 1.0 indicates low food expenditures that may be inadequate since the TFP was designed to be a minimal-cost nutritious diet. Median food expenditure relative to the cost of the TFP was highest for men living alone (1.58).

Median food expenditures relative to the cost of the TFP were lower for Black non-Hispanic (1.08) and Hispanic households (1.13) than for White non-Hispanic households (1.32). This pattern is consistent with the lower average incomes and higher prevalence rates of food insecurity for these racial and ethnic minorities.

As expected, households with higher incomes spent more money on food than lower income households.²⁷ The typical household with income below the poverty line spent about 4 percent less than the cost of the TFP, while the typical household with income above 185 percent of the poverty line spent 38 percent more than the cost of the TFP.

Median food spending relative to the cost of the TFP was lower for households in nonmetropolitan areas (1.14) than for those inside metropolitan statistical areas (1.26). Regionally, median spending on food relative to the cost of the TFP was somewhat lower in the Midwest (1.20) and South (1.21) than in other regions.

Food Expenditures and Household Food Security

Food-secure households typically spent more on food than food-insecure households. Median food spending relative to the cost of the TFP was 1.29 among food-secure households, compared with 1.00 among food-insecure households (table 7). Taking into account estimated food need, the median food-secure household spent approximately 29 percent more for food than the median food-insecure household in 2016 (estimated as $1.29/1.00=1.29$).²⁸

²⁷However, food spending does not rise proportionately with income increases, so high-income households actually spend a smaller proportion of their income on food than low-income households.

²⁸The pattern of higher food spending among food-secure households compared with food-insecure households was also found in USDA's National Food Acquisition and Purchase Survey (FoodAPS) data (Tiehen, Newman, and Kirilin, 2017).

Table 7

Weekly household food spending per person and relative to the cost of the Thrifty Food Plan (TFP) by food security status, 2016

Category	Number of households ¹	Median weekly food spending	
		Per person	Relative to cost of TFP
	<i>1,000</i>	<i>Dollars</i>	<i>Ratio</i>
All households	115,482	50.00	1.22
Food security status:			
Food-secure households	100,640	50.00	1.29
Food-insecure households	14,656	40.00	1.00
Households with low food security	8,883	40.00	1.05
Households with very low food security	5,772	40.00	.93

Note: These estimates are based on categorical food spending data rather than on continuous data that were used in previous years. Beginning with the 2015 Current Population Survey Food Security Supplement, food spending amounts are categorized in public-use data. ERS analysis suggests that this change has little effect on the estimates of median food spending reported here.

¹Total for all households excludes households that did not answer the questions about spending on food or reported zero usual spending for food. These represented 8.9 percent of all households. Totals in the bottom section also exclude households that did not answer any of the questions in the food security scale.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

Federal Food and Nutrition Assistance Programs and Food Security

Households with limited resources employ a variety of methods to help meet their food needs. Some participate in one or more of the Federal food and nutrition assistance programs or obtain food from emergency food providers in their communities to supplement the food they purchase. Households that turn to Federal and community food and nutrition assistance programs typically do so because they are having difficulty meeting their food needs. The use of such programs by low-income households provides insight into the extent of these households' difficulties in obtaining enough food. The relationship between food security status and use of food and nutrition assistance programs also provides insight into the ways low-income households cope with difficulties in acquiring adequate food.

This section presents information about the food security status of households that participated in the three largest Federal food and nutrition assistance programs, SNAP, the National School Lunch Program, and WIC (see box, "Federal Food and Nutrition Assistance Programs," p. 29). It also provides information about the extent to which food-insecure households participated in these programs. Total participation in the Federal food and nutrition assistance programs, participation rates of eligible households in those programs, and characteristics of participants in the programs are not described in this report. Extensive information on those topics is available from USDA's Food and Nutrition Service (FNS).²⁹

Statistical Supplement tables S-11 to S-16 provide information on food spending by participants and low-income nonparticipants in selected Federal and community food and nutrition assistance programs and about the extent to which households obtained assistance from community food pantries and emergency kitchens (Coleman-Jensen et al., 2017).

Methods

The December 2016 CPS food security survey included questions about the use of Federal food and nutrition assistance programs. All households with reported annual incomes below 185 percent of the Federal poverty threshold were asked these questions. In order to minimize the burden on respondents, households with annual incomes above that range were not asked the questions unless they indicated some level of difficulty in meeting their food needs on the first of the two preliminary screener questions asked of all households (listed in footnote 5, p. 4) The questions analyzed in this section are:

- During the past 12 months ... did anyone in this household get SNAP or food stamp benefits?³⁰

²⁹Information on Federal food and nutrition assistance programs, including participation rates and characteristics of participants, is available from the FNS website. Additional research findings on the operation and effectiveness of these programs are available from the ERS website.

³⁰The Food Stamp Program was renamed the Supplemental Nutrition Assistance Program (SNAP) in October 2008. Both names were mentioned in the survey question, as well as the State's name for the program in States that used a different name.

Federal Food and Nutrition Assistance Programs

The U.S. Department of Agriculture's Food and Nutrition Service (FNS) administers 15 domestic food and nutrition assistance programs. The three largest programs are¹:

- The Supplemental Nutrition Assistance Program (SNAP), formerly the Food Stamp Program. The program provides monthly benefits to eligible low-income households to purchase food items at SNAP authorized retailers. SNAP is available to all individuals who meet financial and nonfinancial eligibility criteria. In an average month of fiscal year 2016 (October 1, 2015, through September 30, 2016), SNAP provided benefits to nearly 44.2 million people in the United States (about 14 percent of individuals). The average benefit was about \$126 per person per month, and total annual Federal expenditure for the program was nearly \$71 billion.
- The National School Lunch Program. The program operates in over 100,000 public and nonprofit private schools and residential childcare institutions. All meals served under the program receive Federal subsidies, and free or reduced-price lunches are available to low-income students. In fiscal year 2016, the program provided lunches to an average of 30.3 million children each school day. Sixty-six percent of the lunches served in 2016 were free, and an additional 7 percent were provided at reduced prices.
- The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The program is a federally funded preventive nutrition program that provides grants to States to support distribution of supplemental foods, healthcare referrals, and nutrition education for low-income pregnant, breastfeeding, and nonbreastfeeding postpartum women, for infants in low-income families, and for children in low-income families who are younger than 5 years old and who are found to be at nutritional risk. Most State WIC agencies provide vouchers that participants use to acquire supplemental food packages at authorized food stores. In fiscal year 2016, WIC served an average 7.7 million participants per month at an average monthly cost for food (after rebates to WIC from manufacturers) of about \$43 per person.

¹For more information, see Oliveira, 2017.

Households that responded affirmatively were then asked:

- In which months were SNAP benefits received?
- On what date did you last receive them?

Information from the three questions was used to identify households that received SNAP benefits in the 30 days prior to the survey.³¹

Additional questions about Federal food and nutrition assistance programs analyzed here are:

- During the past 30 days, did any children in the household ... receive free or reduced-price lunches at school? (Only households with children between the ages of 5 and 18 were asked this question.)
- During the past 30 days, did any women or children in this household get food through the WIC program? (Only households with a child under age 5 or a woman age 15-45 were asked this question.)

³¹Note that the CPS household does not always match the SNAP unit. In some households, only some members are eligible for SNAP (Czajka et al., 2012; Scherpf, Newman, and Prell, 2015).

Prevalence rates of food security, food insecurity, and very low food security were calculated for households reporting use of each food and nutrition assistance program and for comparison groups of nonparticipating households with incomes and household compositions similar to those of food assistance recipients. Statistics for participating households excluded households with annual incomes above the ranges specified for the comparison groups.³² The proportions of food-insecure households participating in each of the three largest Federal food and nutrition assistance programs—SNAP, the National School Lunch Program, and WIC—were calculated, as well as the proportion that participated in any of the three programs. These analyses were restricted to households with annual incomes below 185 percent of the poverty line because most households with incomes above this range were not asked whether they participated in these programs.

Food Security of Households That Received Federal Food and Nutrition Assistance

The relationship between food security and the use of food and nutrition assistance programs is complex. There are reasons to expect that households that report using food and nutrition assistance programs in a one-time survey can either be more food secure or less food secure than low-income households not using those programs. Since the programs provide food and other resources to reduce the severity of food insecurity, households are expected to be more food secure after receiving program benefits than they were before. On the other hand, it is the more food-insecure households, those having greater difficulty meeting their food needs, that seek assistance from the programs.³³ An estimated 51.2 percent of households that received SNAP benefits were food insecure, as were 43.0 percent of households that received free or reduced-price school lunches and 40.6 percent of those that received WIC benefits (table 8). The prevalence of very low food security among households participating in SNAP was more than double that of nonparticipating households in the same low-income range (22.7 percent versus 10.3 percent). For households that received free or reduced-price school lunches, the prevalence of very low food security was also higher than for nonparticipating households with school-age children in the same income range (13.9 percent versus 7.3 percent).

A possible complicating factor in interpreting table 8 is that food insecurity was measured over a 12-month period. An episode of food insecurity may have occurred at a different time during the year than the use of a specific food and nutrition assistance program. A similar tabulation using a 30-day measure of food insecurity largely overcomes this potential problem because measured food insecurity and reported use of food and nutrition assistance programs are more likely to refer to concurrent conditions when both are referenced to the previous 30 days. That tabulation shows patterns of food insecurity and the use of food and nutrition assistance programs that are similar to those in table 8, although 30-day food insecurity prevalence rates were somewhat lower than the corresponding 12-month rates (see Statistical Supplement table S-15; Coleman-Jensen et al., 2017).

³²Some program participants reported annual incomes that were higher than 12 times the program eligibility criteria, which are based on monthly income (relative to poverty). They may have had monthly incomes below the monthly eligibility threshold during part of the year, or subfamilies within the household may have had incomes low enough to have been eligible.

³³This “self-selection” effect is evident in the association between food security and food program participation observed in the food security survey. Participating households were less food secure than similar nonparticipating households. More complex analysis, using methods to account for this self-targeting, is required to assess the extent to which the programs improve food security (see Gregory, Rabbitt, and Ribar, 2015, for a review of this literature and these methods; also see Mabli et al., 2013; Nord, 2013; Nord, 2012; Nord and Prell, 2011; Ratcliffe and McKernan, 2011; Nord and Golla, 2009; Yen et al., 2008; Wilde and Nord, 2005; Gundersen and Oliveira, 2001; Gundersen and Gruber, 2001; Nelson et al., 1998).

Table 8

Percentage of households by food security status and participation in selected Federal food and nutrition assistance programs, 2016

Category	Food secure	Food insecure		
		All	With low food security	With very low food security
		<i>Percent</i>		
Income less than 130 percent of poverty line:				
Received SNAP ¹ benefits previous 12 months	48.8	51.2	28.5	22.7
Received SNAP benefits all 12 months	50.3	49.7	27.9	21.8
Received SNAP benefits 1 to 11 months	45.4	54.6	29.9	24.7
Did not receive SNAP benefits previous 12 months	75.8	24.2	13.9	10.3
Income less than 185 percent of poverty line; school-age children in household:				
Received free or reduced-price school lunch previous 30 days	57.0	43.0	29.1	13.9
Did not receive free or reduced-price school lunch previous 30 days	76.9	23.1	15.8	7.3
Income less than 185 percent of poverty line; children under age 5 in household:				
Received WIC ² previous 30 days	59.4	40.6	26.9	13.7
Did not receive WIC previous 30 days	71.9	28.1	20.4	7.7

¹SNAP = Supplemental Nutrition Assistance Program, formerly the Food Stamp Program.

²WIC = Special Supplemental Nutrition Assistance Program for Women, Infants, and Children.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

Participation in Federal Food and Nutrition Assistance Programs by Food-Insecure Households

About 59 percent of food-insecure households reported receiving assistance from one or more of the three largest Federal food and nutrition assistance programs during the month prior to the December 2016 food security survey (table 9). SNAP provided assistance to 43.6 percent of food-insecure households; children in 29.8 percent of food-insecure households received free or reduced-price school lunches, and women or children in 9.5 percent of food-insecure households received WIC food vouchers.³⁴ An estimated 55.6 percent of households classified as having very low food security reported participating in one or more of the three largest Federal food and nutrition assistance programs, with the largest share (45.8 percent) participating in SNAP.³⁵

³⁴These may be biased downward. It is known from comparisons between household survey data and administrative records that food program participation is underreported by household survey respondents, including those in the CPS (Meyer and George, 2011; Parker, 2011; Meyer et al., 2009). This is probably true for food-insecure households as well, although the extent of underreporting by these households is not known. Statistics are based on the subsample of households with annual incomes below 185 percent of the poverty line. Not all of these households were eligible for certain programs. (For example, many households without pregnant women or children and with incomes above 130 percent of poverty would not have been eligible for any of the programs.)

³⁵The statistics in table 9 were also calculated for households that were food insecure during the 30-day period prior to the survey. In principle, that analysis is preferable because food security status and use of programs are more certainly contemporaneous than when food insecurity is assessed over a 12-month period. However, the results differed only slightly from those in table 9 and are not presented in a separate table. In 2016, an estimated 60.3 percent of households that were food insecure during the 30-day period prior to the survey participated in SNAP, free or reduced-price school lunch, or WIC during that same period. Among households that experienced very low food security in the 30-day period prior to the survey, 58 percent participated in SNAP, free or reduced-price school lunch, or WIC during that same period.

Table 9

Participation of food-insecure households in selected Federal food and nutrition assistance programs, 2016

Program	Share of food-insecure households that participated in the program during the previous 30 days ^{1,2}	Share of households with very low food security that participated in the program during the previous 30 days ^{1,2}
	<i>Percent</i>	
SNAP ³	43.6	45.8
Free or reduced-price school lunch	29.8	22.8
WIC ⁴	9.5	7.6
Any of the three programs	59.0	55.6
None of the three programs	41.0	44.4

¹Analysis is restricted to households with annual incomes less than 185 percent of the poverty line because most households with incomes above that range were not asked whether they participated in food assistance programs.

²These statistics understate the extent of food and nutrition program participation because program participation is underreported by household survey respondents; see footnote 34.

³SNAP = Supplemental Nutrition Assistance Program, formerly the Food Stamp Program.

⁴WIC = Special Supplemental Nutrition Assistance Program for Women, Infants, and Children.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau, 2016 Current Population Survey Food Security Supplement.

References

- Anderson, S.A. (ed.). 1990. "Core Indicators of Nutritional State for Difficult-To-Sample Populations," *Journal of Nutrition* 120(11S):1557-1600. Report by the Life Sciences Research Office, Federation of American Societies for Experimental Biology, for the American Institute of Nutrition.
- Andrews, Margaret, Gary Bickel, and Steven Carlson. 1998. "Household Food Security in the United States in 1995: Results From the Food Security Measurement Project," *Family Economics and Nutrition Review* 11(1&2):17-28, U.S. Department of Agriculture, Center for Nutrition Policy and Promotion.
- Bartfeld, Judi, Rachel Dunifon, Mark Nord, and Steven Carlson. 2006. *What Factors Account for State-to-State Differences in Food Security?* EIB-20, U.S. Department of Agriculture, Economic Research Service.
- Bickel, G., M. Andrews, and S. Carlson. 1998. "The Magnitude of Hunger: A New National Measure of Food Security," *Topics in Clinical Nutrition* 13(4):15-30.
- Bickel, G., M. Nord, C. Price, W.L. Hamilton, and J.T. Cook. 2000. *Guide to Measuring Household Food Security, Revised 2000*. U.S. Department of Agriculture, Food and Nutrition Service.
- Carlson, S.J., M.S. Andrews, and G.W. Bickel. 1999. "Measuring Food Insecurity and Hunger in the United States: Development of a National Benchmark Measure and Prevalence Estimates," *The Journal of Nutrition* 129(2):510S-516S.
- Czajka, John L., Anne Peterson, Brittany McGill, Betsy Thorn, and Catharine Warner-Griffin. 2012. *The Extent and Nature of Underreporting of SNAP Participation in Federal Surveys*. U.S. Department of Agriculture, Food and Nutrition Service.
- Coleman-Jensen, Alisha, William McFall, and Mark Nord. 2013. *Food Insecurity in Households With Children: Prevalence, Severity, and Household Characteristics, 2010-11*. EIB-113, U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen, Alisha. 2015. "Commemorating 20 Years of U.S. Food Security Measurement," *Amber Waves* 13(9), U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen, Alisha, Mark Nord, Margaret Andrews, and Steven Carlson. 2014. *Household Food Security in the United States in 2013*. ERR-173, U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen, Alisha, Matthew P. Rabbitt, Christian Gregory, and Anita Singh. 2016. *Household Food Security in the United States in 2015*. ERR-215, U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen, Alisha, Matthew P. Rabbitt, Christian Gregory, and Anita Singh. 2017. *Statistical Supplement to Household Food Security in the United States in 2016*. AP-077, U.S. Department of Agriculture, Economic Research Service.

- Fram, Maryah Stella, Edward A. Frongillo, Sonya J. Jones, Roger C. Williams, Michael P. Burke, Kendra P. DeLoach, and Christine E. Blake. 2011. "Children are aware of food insecurity and take responsibility for managing food resources," *The Journal of Nutrition* 141(6):1114-19.
- Gregory, Christian, and Alisha Coleman-Jensen. 2017. *Food Insecurity, Chronic Disease, and Health Among Working-Age Adults*, ERR-235. U.S. Department of Agriculture, Economic Research Service.
- Gregory, Christian A., Matthew P. Rabbitt, and David C. Ribar. 2015. "The Supplemental Nutrition Assistance Program and Food Insecurity," in *SNAP Matters: How Food Stamps Affect Health and Well-Being*, Judith Bartfeld, Craig Gundersen, Timothy M. Smeeding, and James P. Ziliak (eds.), pp. 74-106. Stanford University Press.
- Gundersen, Craig, and Joseph Gruber. 2001. "The Dynamic Determinants of Food Insecurity." In *Second Food Security Measurement and Research Conference, Volume II: Papers*, FANRR-11-2, Margaret Andrews and Mark Prell (eds.), pp. 92-110. U.S. Department of Agriculture, Economic Research Service.
- Gundersen, Craig, and Victor Oliveira. 2001. "The Food Stamp Program and Food Insufficiency," *American Journal of Agricultural Economics* 83(4):875-87.
- Hamilton, W.L., J.T. Cook, W.W. Thompson, L.F. Buron, E.A. Frongillo, Jr., C.M. Olson, and C.A. Wehler. 1997a. *Household Food Security in the United States in 1995: Summary Report of the Food Security Measurement Project*, prepared for U.S. Department of Agriculture, Food and Consumer Service.
- Hamilton, W.L., J.T. Cook, W.W. Thompson, L.F. Buron, E.A. Frongillo, Jr., C.M. Olson, and C.A. Wehler. 1997b. *Household Food Security in the United States in 1995: Technical Report*, prepared for U.S. Department of Agriculture, Food and Consumer Service.
- Mabli, James, Jim Ohls, Lisa Dragoset, Laura Castner, and Betsy Santos. 2013. *Measuring the Effect of Supplemental Nutrition Assistance Program (SNAP) Participation on Food Security*, prepared for U.S. Department of Agriculture, Food and Nutrition Service.
- Meyer, Bruce D., and Robert M. George. 2011. "Errors in Survey Reporting and Imputation and their Effects on Estimates of Food Stamp Program Participation." Working Paper, The Harris School, University of Chicago.
- Meyer, Bruce D., Wallace K.C. Mok, and James X. Sullivan. 2009. "The Under-Reporting of Transfers in Household Surveys: Its Nature and Consequences." NBER Working Paper No. 15181. Cambridge, MA: National Bureau of Economic Research.
- National Research Council. 2006. *Food Insecurity and Hunger in the United States: An Assessment of the Measure*. Committee on National Statistics, Panel to Review the U.S. Department of Agriculture's Measurement of Food Insecurity and Hunger, Gooloo S. Wunderlich and Janet L. Norwood (eds.). Washington, DC: The National Academies Press.
- Nelson, K., M. Brown, and N. Lurie. 1998. "Hunger in an Adult Patient Population," *Journal of the American Medical Association* 279(15):1211-14.

- Nord, Mark. 2009a. *Food Insecurity in Households With Children: Prevalence, Severity, and Household Characteristic*. EIB-56, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark. 2009b. *Food Spending Declined and Food Insecurity Increased for Middle-Income and Low-Income Households from 2000 to 2007*. EIB-61, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark. 2012. "How Much Does the Supplemental Nutrition Assistance Program Alleviate Food Insecurity? Evidence from Recent Programme Leavers," *Public Health Nutrition* 15(5): 811-17.
- Nord, Mark. 2013. *Effects of the Decline in the Real Value of SNAP Benefits From 2009 to 2011*. ERR-151, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark, Margaret Andrews, and Steven Carlson. 2007. *Household Food Security in the United States, 2006*. ERR-49, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark, Margaret Andrews, and F. Joshua Winicki. 2000. "Frequency and Duration of Food Insecurity and Hunger in U.S. Households." Paper presented at the Fourth International Conference on Dietary Assessment Methods, Tucson, AZ, Sept. 17-20, 2000.
- Nord, Mark, and Gary Bickel. 2002. *Measuring Children's Food Security in U.S. Households, 1995-9*. FANRR-25, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark, and Alisha Coleman-Jensen. 2014. "Improving Food Security Classification of Households With Children," *Journal of Hunger and Environmental Nutrition* 9(3):318-33.
- Nord, Mark, and Anne Marie Golla. 2009. *Does SNAP Decrease Food Insecurity? Untangling the Self-Selection Effect*. ERR-85, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark, and Karla Hanson. 2012. "Adult caregiver reports of adolescents' food security do not agree well with adolescents' own reports," *Journal of Hunger and Environmental Nutrition* 7(4):363-80.
- Nord, Mark, and Heather Hopwood. 2007. "Recent Advances Provide Improved Tools for Measuring Children's Food Security," *Journal of Nutrition* 137(3):533-36.
- Nord, M., K. Jemison, and G.W. Bickel. 1999. *Prevalence of Food Insecurity and Hunger by State, 1996-1998*. FANRR-2, U.S. Department of Agriculture, Economic Research Service.
- Nord, Mark, and Linda S. Kantor. 2006. "Seasonal Variation in Food Insecurity Is Associated with Heating and Cooling Costs Among Low-Income Elderly Americans," *Journal of Nutrition* 136(11):2939-44.
- Nord, Mark, and Mark Prell. 2011. *Food Security Improved Following the 2009 Increase in SNAP Benefits*. ERR-116, U.S. Department of Agriculture, Economic Research Service.
- Oliveira, Victor. 2017. *The Food Assistance Landscape: FY 2016 Annual Report*. EIB-169, U.S. Department of Agriculture, Economic Research Service.

- Oliveira, Victor, and Donald Rose. 1996. *Food Expenditure Estimates From the 1995 CPS Food Security Supplement: How Do They Compare With the Consumer Expenditure Survey?* Staff Report No. AGES9617, U.S. Department of Agriculture, Economic Research Service.
- Parker, Julie. 2011. “SNAP Misreporting on the CPS: Does it Affect Poverty Estimates?” Social, Economic, and Housing Statistics Division Working Paper No. 2012-1, U.S. Department of Commerce, U.S. Census Bureau.
- Ratcliffe, Caroline, and Signe-Mary McKernan. 2011. “How Much Does the Supplemental Nutrition Assistance Program Reduce Food Insecurity?” *American Journal of Agricultural Economics* 93(4):1082-98.
- Ryu, Jeong-Hee, and Judith S. Bartfeld. 2012. “Household Food Insecurity During Childhood and Subsequent Health Status: The Early Childhood Longitudinal Study–Kindergarten Cohort,” *American Journal of Public Health* 102(11):e50-e55.
- Scherpf, Erik, Constance Newman, and Mark Prell. 2015. *Improving the Assessment of SNAP Targeting Using Administrative Records*. ERR-186, U.S. Department of Agriculture, Economic Research Service.
- Tiehen, Laura, Constance Newman, and John Kirlin. 2017. *The Food Spending Patterns of SNAP Households: Findings From the National Food Acquisition and Purchase Survey Data*. EIB-176, U.S. Department of Agriculture, Economic Research Service.
- U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. 2017. *Official USDA Food Plans: Cost of Food at Home at Four Levels, U.S. Average, December 2016*.
- U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. 2007. *The Thrifty Food Plan, 2006*. CNPP-19.
- Wilde, Parke, and Mark Nord. 2005. “The Effect of Food Stamps on Food Security: A Panel Data Approach,” *Review of Agricultural Economics* 27(3):425-32.
- Wilde, Parke E., Robert E. Zagar, and Mark Nord. 2010. “In Longitudinal Data from the Survey of Program Dynamics, 16.9% of the U.S. Population Was Exposed to Household Food Insecurity in a 5-Year Period,” *Journal of Hunger and Environmental Nutrition* 5(3):380-98.
- Yen, Steven T., Margaret Andrews, Zhuo Chen, and David B. Eastwood. 2008. “Food Stamp Program Participation and Food Insecurity: An Instrumental Variables Approach,” *American Journal of Agricultural Economics* 90(1):117-32.