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PERSPECTIVES ON
OPPORTUNITY

# Economic Characteristics of the Food Insecure

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The United States Department of Agriculture annually measures food insecurity among US households to assess whether Americans have access to adequate food. Intuition suggests that food insecurity rates should correlate to household resources, offering policymakers an important metric to guide government assistance efforts. In this report, we examine the effectiveness of the food insecurity rate in identifying financially constrained households by exploring the income and food-expenditure distributions for households experiencing food insecurity and comparing them to those who are food secure. Consistent with intuition, we find that food-insecure households skew toward the bottom of the income distribution. However, after adjusting for household composition and regional variation in cost of living, we find that one-quarter of food-insecure households fall within the top three quintiles of the income distribution and that food-insecure households spend about as much as food-secure households do on food per week. Lastly, we find that the relationship between food insecurity and indicators of economic hardship has weakened over time.

Over the past several decades, the economic well-being of low-income households has improved. From 2000 to pre-pandemic 2019, the income-based supplemental poverty measure declined from 14.1 percent to 11.2 percent (Wimer et al. 2022). Poverty rates based on household consumption declined even more, from 18.8 percent in 2000 to 9.0 percent in 2019 (Han, Meyer, and Sullivan 2023). Income grew at the bottom of the income distribution (Guzman and Kollar 2023), and average life expectancy increased by two years (CDC 2023). Since the pandemic, substantial expansions to the US safety net further reduced poverty rates and helped grow income at the bottom of the income distribution (East, Edelberg, and Steinmetz-Silber 2023; Wilken 2023). However, one measure of hardship did not follow these same positive trends over this period: the food insecurity rate.

The food insecurity rate measures the share of US households that have "limited or uncertain access to adequate food" (ERS 2023). Despite large increases in federal spending on food assistance programs, the food insecurity rate has fluctuated over time but was roughly the same in pre-pandemic 2019 as in 2001—and in 2022, households reported the largest one-year increase in at least a decade. In 2001, the year consistent food insecurity statistics first became available, 10.7 percent of households were food insecure. After

the Great Recession, the food insecurity rate peaked at 14.9 percent in 2011 and started to decline, but even by 2019, the food insecurity rate was about the same as it was in 2001 at 10.5 percent. Following the aftermath of the COVID-19 pandemic in 2022 and historic increases in food prices (Rachidi and Gundersen 2024), the food insecurity rate rose to 12.8 percent of households (Rabbitt et al. 2023).

The US has made less progress on food insecurity than it has on other indicators of material hardship, such as the poverty rate, which raises questions about the relationship between food insecurity and economic hardship. This report explores income status and food expenditures by food security status to better understand the economic characteristics of food-insecure households.

First, it is important to understand the concept of food insecurity and the methods used to measure it. In response to concerns about rising hunger levels in America, the US Department of Agriculture (USDA) developed a survey-based method to measure food hardship in the 1990s. Following a lengthy review process, the Bureau of Labor Statistics added the survey instrument, known as the Food Security Supplement (FSS), once per year into its monthly Current Population Survey (CPS)—the official data source used for government statistics on unemployment, income, and poverty. Beginning in 2001, a representative sample of Americans have been asked up to 18 questions about their access to food (Nord, Coleman-Jensen, and Gregory 2014).[1] The questions aim to capture a wide scope of food hardship, ranging in severity from "We couldn't afford to eat balanced meals" to "Did you or other adults in the household ever not eat for a whole day because there wasn't enough money for food?"

Food insecurity is measured on a continuous scale. Depending on households' responses to the 18-question survey, they can be classified as food secure, low food secure, or very low food secure. At the low end of severity, food-insecure households "feel anxiety about the sufficiency of their food to meet basic needs and make adjustments to their food budget and food served." At more extreme levels of food insecurity, household members go without eating or skip meals (Hamilton et al. 1997).

Conceptually, food insecurity is difficult to measure. Whereas biological measures of food hardship such as malnourishment are clearly defined and can be evaluated by a medical professional, having "limited or uncertain access to adequate food" is inherently subjective. Food insecurity also differs from objective measures of economic well-being, such as income.[2] That is, individuals and households will necessarily differ in their assessments of what constitutes "*certain*" access to "*adequate*" food. Indeed, the USDA notes that it is ultimately up to the household—not an external objective standard—to assess the accessibility and availability of food in that household (Hamilton et al. 1997).

This subjective approach for measuring food insecurity has certain strengths and weaknesses. Positively, households seem best equipped to assess whether they have sufficient access to adequate food, and the subjective nature of the FSS questions allows households to testify directly to the accessibility and availability of their perception of adequate food.

However, measuring food insecurity in this way also has some weaknesses. For one, if different households have different standards to determine what constitutes a sufficient amount of adequate food, then household food insecurity will not necessarily correlate with household resources, making policy responses difficult. Further, if members of different households have varying perspectives on what constitutes "worrying about food" or "skipping meals," those households might have the same level of resources but perceive their food hardship differently. Moreover, if standards or interpretations of food-insecure conditions (e.g., what constitutes a balanced meal) change over time, then year-to-year changes in food insecurity become difficult to interpret.[3]

For the most part, we should expect that food-insecure households are more resource constrained than food-

1 Households without children are asked 10 questions, and households with children are asked 18 questions.

2 Consider, for example, if poverty were measured by asking household respondents whether they had enough money to afford what they needed or if they worried about affording what they needed. Households with relatively high levels of income could conceivably report being in poverty.

3 For a full discussion of the theoretical debates underlying food insecurity measurement, see Wilde (2004).

secure households are. This expectation comes from an assumption that "limited or uncertain access to adequate food" stems from a lack of financial resources. This interpretation is consistent with popular understanding of food insecurity statistics. Policymakers and government officials, for example, often cite changes in the food insecurity rate to justify expansions to food assistance programs and the safety net more broadly (Vilsack 2023). Additionally, this assumption is inherent in the way the FSS is administered. Only higher income households who respond a certain way to a screener question screen out of the FSS.

While much research exists that assesses whether the FSS accurately measures food insecurity, much of it focuses on assessing the internal, rather than external, validity of the food security measure. In other words, most research focuses on whether each of the FSS survey questions measures the same underlying concept and if households answer these questions consistently. Less research, however, investigates how well food insecurity relates to other measures of material hardship and the extent to which the concept of food insecurity is consistent across individuals. Indeed, the USDA's inaugural food insecurity report noted that household-level food insecurity status is only loosely related to household poverty status, writing that "food insecurity is clearly related to income and poverty, but the relationship is not exact" (Hamilton et al. 1997).

We contribute to this literature by documenting the income and food-expenditure distributions of food-insecure households. Using data from the FSS, we examine how household-level food insecurity relates to income and food expenditures. We also examine whether the relationship between food insecurity and these measures of economic well-being has meaningfully changed over time and whether food security is a better or worse measure of hardship than it was in years past.

The report proceeds as follows: First, we review the literature on the validity of the food insecurity measure and its relationship to other economic measures, and we then describe the data. Next, we present our results on income and expenditures. We then conclude by summarizing the major findings and discussing the policy implications.

## Literature Review

Much of the literature on the validity of the FSS has focused on assessing the internal validity of the survey instrument. Comparatively less research, however, has investigated the cognitive or external validity of the FSS.

In the initial 1995 USDA report detailing the development of the FSS, the authors demonstrated that the food security scale was internally valid and reliable (Hamilton et al. 1997). Relying on various forms of factor analyses, the researchers demonstrated that food insecurity could be measured on a single unidimensional scale. Moreover, the researchers documented that the 18-question survey instrument captured a range of severity in food insecurity. Food-insecure households could range from having uncertainty and anxiety about having a sufficient amount of food to more severe forms of food hardship—such as forgoing meals due to financial constraints. Lastly, the authors documented that households respond to survey questions reliably. That is, households responding affirmatively to the most severe questions also responded affirmatively to relatively less severe questions. Each of these validation exercises indicate that the FSS accurately captures some unobservable measure of food hardship as perceived by the respondent.[4]

Another large and growing body of research investigates whether food insecurity measures are valid internationally (Frongillo 2022) and how household-level food insecurity is best measured cross-culturally (Nguyen et al. 2023). Yet other research investigates how macroeconomic trends relate to food insecurity. For instance, Nord and Prell (2007) demonstrate how the national food insecurity rate is highly correlated with the official poverty rate, even though the household-level poverty status is not as closely related to household-level food insecurity. More recently, Morrissey et al. (2016) found that neighborhood poverty status is predictive of childhood food insecurity, but they noted that "family income alone does not explain food insecurity."

Other research more directly investigates the household-level determinants of food insecurity. Much of this research finds that the group identified by the FSS as food insecure may not be consistent with external expectations. For example, Gundersen and Ribar (2011) documented that the majority of households with low incomes

4 For a review of many of the early studies on the validity of the food security measure, see Frongillo (1999).

and low food expenditures were food secure. Nord and Brent (2002) showed that fully one-fifth of food-insecure households had incomes above 185 percent of the federal poverty line (FPL). Furthermore, Smith and Gregory (2023) showed that food-insecure households often consume "enough (or even too many) calories" and have significantly less nutritious diets than food-secure households do.

Even less research has investigated the cognitive validity of the FSS. Cognitive validity assesses the extent of interpretational variation in a given set of survey questions. Survey instruments exhibiting the least variation in possible interpretations are said to be cognitively valid, meaning that responses to the given survey questions capture the survey designers' intent consistently across respondents. In the context of the FSS, if households vary in how they interpret survey questions, then the survey instrument would have weak cognitive validity and would inconsistently measure food insecurity across households.

Alaimo, Olson, and Frongillo (1999) used cognitive testing on the FSS and found that the FSS questions capturing the most severe levels of food hardship exhibited the strongest cognitive validity. However, they also found that less severe terms common throughout the FSS, such as "not eating enough," exhibited much more interpretational variation across respondents. More recent cognitive testing on the FSS found that recent changes to the survey did not substantially affect the interpretation of questions (Kephart et al. 2021). However, researchers did find that certain questions—such as those asking about the households' ability to procure balanced meals—were interpreted inconsistently across respondents.[5] Importantly, the small number of studies investigating the cognitive validity of the FSS often relied on a sample of low-income households, which may systematically differ from respondents in higher-income households.

In sum, much of the food insecurity research has found that (1) food insecurity can be measured on a single dimension and continuous scale; (2) individual households respond to questions consistently—meaning that their responses to a given question are consistently conditional on responses based on the question severity; and (3) this internal consistency is the same across different demographic groups.

However, research also raises questions about how well household-level food insecurity correlates with other measures of material hardship and whether the interpretation of FSS questions is consistent across households. Some research has shown that many terms in the FSS can be interpreted inconsistently (Alaimo, Olson, and Frongillo 1999) and that low-income, low-expenditure households are mostly food secure (Gundersen and Ribar 2011), further raising questions about cognitive validity and the relationship between objective measures of hardship and food insecurity.

## Data

For these analyses, we rely on FSS data from 2001 to 2022. Though the FSS began in 1995, it did not consistently collect food insecurity data until 2001.[6] Since 2001, much of the FSS has remained unchanged, allowing researchers to examine trends in food insecurity over time.[7]

First, we rely on the battery of questions used to assess household-level food insecurity. Households are screened into the food security questionnaire if they have household incomes below 185 percent of the FPL or if they answer negatively to a survey question asking whether their household has enough food or the kinds of food they want.[8] Households not screened into the survey are considered food secure, and those screened into the FSS are asked up to 18 questions related to their

5 Additionally, in 2022, the US Department of Agriculture (USDA) altered the question order and some of the language in the Food Security Supplement (FSS). An evaluation of these updates showed that the changes led to a statistically significant 1 percentage point increase in the food insecurity rate (Coleman-Jensen and Rabbitt 2023). These updates may affect individuals' responses to the FSS.

6 Before 2001, the FSS was fielded at various points throughout the year. Beginning in 2001, the supplement was fielded in December.

7 Minor changes were made to question wording in 2008 and 2022, and while some research has shown that these changes may have affected the interpretation of year-to-year changes in food insecurity, the USDA still publishes a consistent time series.

8 Specifically, the FSS asks, "Which of these statements best describes the food eaten in your household—enough of the kinds of food (I/we) want to eat, enough but not always the kinds of food (I/we) want to eat, sometimes not enough to eat, or often not enough to eat?" If households indicate that they sometimes or often do not have the kinds of foods they want to eat or that they sometimes or often do not have enough food to eat, then they are screened into the food security questionnaire.

ability to procure a healthy and adequate diet. Although all questions are conditioned on having a financial limitation (i.e., cutting meals for diet-related purposes is not considered a food-insecure condition), they range in severity from being unable to afford balanced meals to not eating for a full day because of inadequate access to food.

Depending on how respondents answer the battery of questions, households fall into one of three categories. A household is food secure if the respondent answers affirmatively to two or fewer questions on the FSS. A household is low food secure if the respondent answers affirmatively to three to seven questions (three to five questions for households without children), and a household is classified as being very low food secure if the respondent answers affirmatively to eight or more questions (six or more questions for households without children).

Households with the latter two designations—low food security and very low food security—are considered "food insecure." Households that are low food secure report "reduced quality, variety, or desirability of diet [but] little or no indication of reduced food intake," whereas households deemed very low food secure "report multiple indications of disrupted eating patterns and reduced food intake" (ERS 2023).

In addition to the questions about food access, the FSS also asks respondents to answer questions about their usual weekly spending on all food. Specifically, the FSS asks respondents to detail how much they spent on food the *previous week* at various places—including grocery stores, dollar stores, pharmacies, vending machines, restaurants, and any other place where the respondent purchased food.[9] The FSS then asks respondents to detail their *usual* weekly spending at all these places. For all the analyses in this report, we rely on the question that asks about usual weekly expenditures rather than the previous week's food expenditures. We do so because usual weekly food expenditures are a better reflection of households' typical expenditures, whereas a given individual's food expenditures the previous week could be subject to more week-to-week variation.

Lastly, because the FSS is part of the CPS, we can observe FSS respondents' demographic and income information. When asking respondents to detail their family income, the CPS offers 16 options to choose from, most of which use $5,000 or $10,000 income intervals (US Census Bureau 2023).

Importantly, however, this income measure does not include the value of in-kind transfers or tax credits, and it has been shown to dramatically understate households' financial resources for those at the bottom of the income distribution (Meyer and Mittag 2019). Specifically, this income measure does not consider the value of the earned income tax credit, the child tax credit, or the Supplemental Nutrition Assistance Program (SNAP), each of which provide a significant source of income to low-income families and could influence assessments of food insecurity. Despite these shortcomings, these statistics provide a rough estimate of households' gross income less tax credits and in-kind transfers.[10]

Using these variables from the monthly CPS and FSS, we can determine the relationship between income, food expenditures, and food insecurity status for each year from 2001 to 2022.

## Results

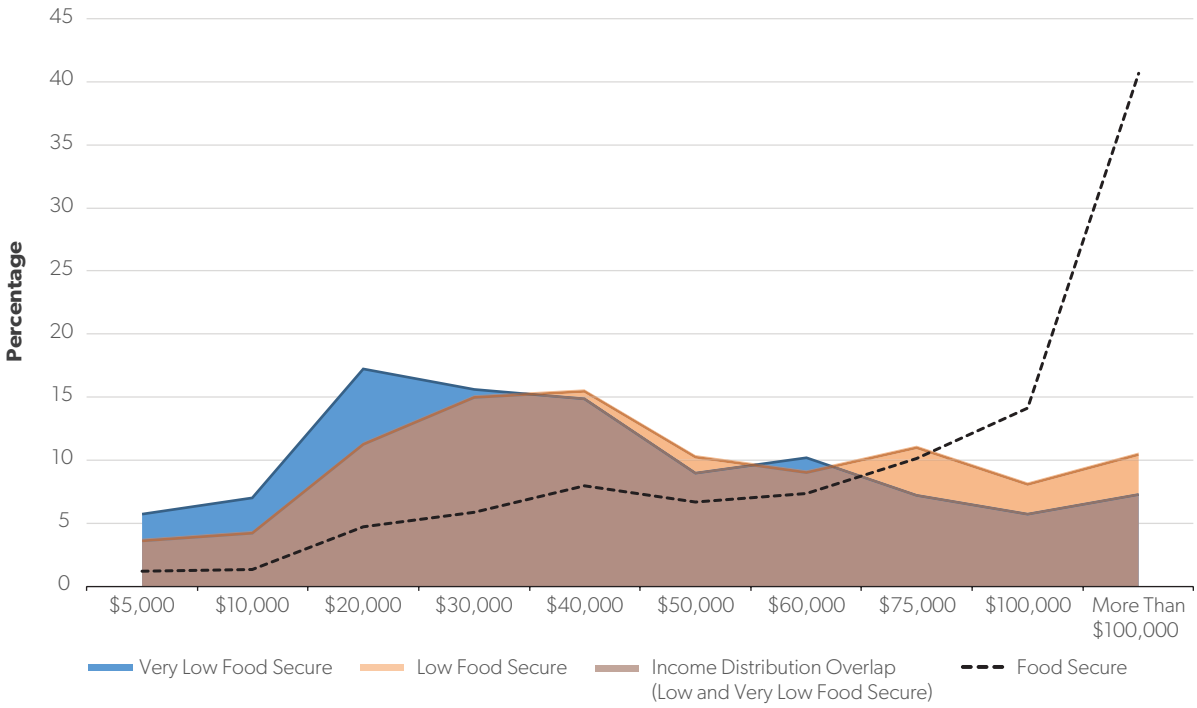
This section presents results on the relationship between food insecurity status and two measures of economic well-being: income and food expenditures.

**Food Insecurity and Income.** Food-insecure households have either "limited or uncertain access to adequate food" due to financial limitations (Rabbitt et al. 2023). All households with incomes below 185 percent of the FPL are administered the FSS. For households with incomes above 185 percent of the FPL, only those that indicate they have insufficient access to food on a screener question are administered the FSS questions. Because the FSS is disproportionately administered to households below 185 percent of the FPL, it imposes that those with relatively high incomes are less likely to

9 FSS questions about food expenditures attempt to fully capture a household's spending on food. Therefore, the survey also asks about food purchases at supermarkets, meat markets, produce stands, bakeries, fast food places, cafeterias, vending machines, and any other place at which the respondent purchased food.

10 The CPS also fields its Annual Social and Economic Supplement (ASEC), which better captures a household's full income. While some who participate in the FSS also participate in the ASEC, the sample sizes are too small to perform some of the analyses in this report.

**Figure 1. Income Distribution by Food Security Status, Adults Age 18 and over, 2022**




Note: Income intervals in the monthly CPS vary from $2,500 at the bottom of the income distribution to $50,000 at the top of the income distribution. In most cases, we combine income categories to create $10,000 income intervals, though in some instances (such as $60,000–75,000), we are required to use a slightly larger interval. Income amounts on the x-axis indicate the upper bound of the income interval.
Source: Authors' calculations from the US Census Bureau (2022).

be food insecure. Therefore, intuition suggests that food-insecure households have lower levels of income compared to food-secure households. Additionally, we should expect that households with very low food security—signaling the highest levels of food hardship—have the lowest levels of income.

In Figure 1, we show the income distributions for the three food security groups: the food secure, the low food secure, and the very low food secure. The blue area reflects the income distribution for the very low food secure, the orange area shows the income distribution for the low food secure, and the dotted black line shows the trace of the income distribution for the food secure. Where the shaded areas and black line overlap (the brown area), we see households that have similar incomes but different food security statuses. If food security status were completely unrelated to income, we would expect to see the same income distributions across groups. Conversely, if income were perfectly predictive of food security status, we would expect to see no areas of overlap between food-secure and food-insecure households.

As Figure 1 makes clear, food-insecure households have a different income profile than food-secure households. Compared to the food secure, the food insecure are overrepresented at the bottom of the income distribution and underrepresented at the top. Specifically, the food insecure are about 4.5 times less likely than the food secure to be in the top income group and about four times more likely to be in the bottom income group. Recall, however, that the FSS questionnaire is administered only to those with incomes below 185 percent of the FPL or those who say they sometimes or often do not have the amount or kinds of food they want. This presupposes that households with higher incomes are less likely to be food insecure.

This finding—that the income profile of the food insecure skews toward the lower end of the income

distribution—is unsurprising given the structure of the food security questions and the general assumption that food insecurity is caused by resource constraints. Because the food security questions are conditioned on having a financial limitation, we should expect food-insecure households to have lower incomes than food-secure households.[11] Notably, however, the income profiles of the two food-insecure groups are reasonably well represented throughout much of the income distribution, with relatively high shares of both groups having household incomes near or above the median household income. That is, half (50 percent) of households with low food security have household incomes above $40,000, and nearly one in five (19 percent) have household incomes above $75,000. Further, Figure 1 shows that a sizable share of food-secure households have incomes at the bottom of the distribution, with similar incomes to many food-insecure households.

Even though "very low food security" is intended to reflect disrupted eating patterns while "low food security" does not, the income distribution of these two groups does not differ greatly. That is, more than one in five households with very low food security have household incomes that place them in the top three income quintiles (21 percent). In real terms, 40 percent of households with very low food security have incomes above $40,000, and 13 percent have incomes greater than $75,000.

Households with relatively high household income can still feel stretched financially, and they might make trade-offs when it comes to their food purchases, making it plausible that they report food insecurity. However, "very low food security" is intended to capture those households that are forgoing meals due to insufficient resources. Our analysis raises questions about whether households with relatively high income levels truly face the level of hardship that very low food insecurity is intended to capture conceptually.

These gross income levels, however, do not consider that food-insecure households may face higher costs of living or have more dependents (such as children or other household members) to care for. Indeed, if food-insecure households disproportionately live in high-cost areas or have more household members compared to the food secure, then nominally high household income may conceal the actual amount of resources available in the household for food.

Therefore, we adjust income to better reflect household resources. To do so, we first take the median of each of the 16 income intervals and designate that as the household's income.[12] Next, we adjust for the cost of living using the regional price parities (RPP) developed by the Bureau of Economic Analysis (BEA). The RPP is a "weighted average of the price level of goods and services in one geographic region compared to all other regions" (BEA 2023). We adjust prices based on households' metropolitan statistical areas, which are groups of counties centered in an urban area with a population of at least 50,000. Higher RPP values indicate relatively higher costs of living, and lower index values indicate relatively lower costs of living (BEA 2023). In 2022, the index ranged from 0.81 (Pine Bluff, Arkansas) to 1.18 (San Francisco–Oakland–Fremont, California).

The BEA does not produce RPP values for nonmetro areas, though it does produce a single RPP value that accounts for average prices across all nonmetro areas. Therefore, for households that do not live in metro areas, we assign them this designated RPP.[13] To adjust for geographic variation in cost of living, we divide household income by each household's RPP. Effectively, this means that a household with an income of $50,000 in Pine Bluff, Arkansas, has a geographic-adjusted household income of $61,728, whereas a household in San Francisco with the same nominal income has $42,372 in geography-adjusted income.

Next, we adjust for household size by simply dividing geography-adjusted income by the square root of the number of household members.[14] Therefore, a household with four members needs double the income of a household with a single member to have the same amount of household-size adjusted income.

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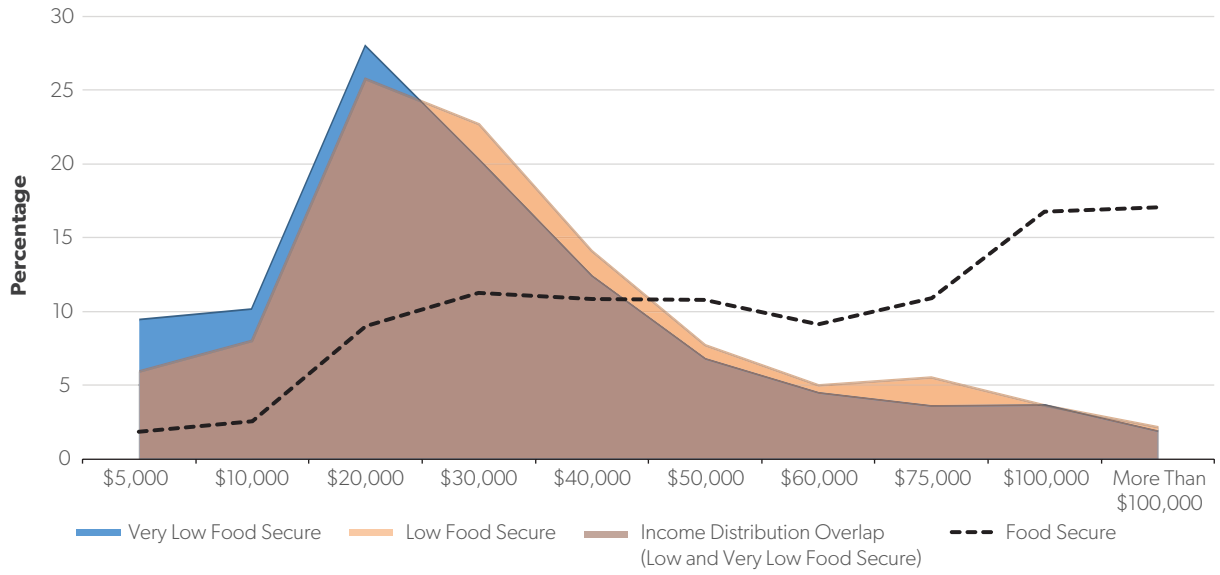
11 One question, for example, asks if the respondent felt that the food they bought didn't last and that they didn't have enough money to buy more. Another question asks whether any household members cut the size of their meals because there wasn't enough money for food.

12 Therefore, a household reporting between $0 and $5,000 of annual income is assigned a household income of $2,500.

13 In 2022, the regional price parities (RPP) for nonmetro areas was 0.866.

14 This is a commonly used method for adjusting household income. See UN Economic Commission for Europe (2011).

**Figure 2. Adjusted Income Distribution by Food Security Status, Adults Age 18 and over, 2022**




Note: Income intervals in the monthly CPS vary from $2,500 at the bottom of the income distribution to $50,000 at the top of the income distribution. In most cases, we combine income categories to create $10,000 income intervals, though in some instances (such as $60,000–75,000), we are required to use a slightly larger interval. Income amounts on the x-axis indicate the upper bound of the income interval.
Source: Authors' calculations from the US Census Bureau (2022).

In Figure 2, we report the income distributions of each group, this time adjusting for household size and cost of living. The blue area reflects the adjusted income distribution for the very low food secure, the orange area reflects the adjusted income distribution for the low food secure, and the dotted black line traces the adjusted income distribution for the food secure.

As Figure 2 indicates, even after adjusting for household size and geographic variation in cost of living, non-negligible shares of the food insecure are in the middle-to-upper end of the income distribution. Conversely, non-negligible shares of food-secure households are in the bottom of the income distribution. Granted, food-insecure households remain overrepresented in the bottom income quintiles; the very low food secure and low food secure are 5.1 and 3.2 times more likely than the food secure to be in the bottom income group, respectively. However, 25 percent of households with low food security and 21 percent of households with very low food security have incomes that place them in the top three quintiles of the adjusted income distribution.[15]

On average, household-level food insecurity strongly correlates with being in the bottom of the income distribution. However, relatively large proportions of the food insecure have household incomes that seemingly place them in the middle class or higher. This is somewhat surprising, because for households with incomes above 185 percent of the FPL, they would first have to respond to a screener question indicating that they did not have "enough of the kinds of food we want to eat" or that they sometimes or often did not have enough to eat. These households would then need to respond affirmatively to at least three food security questions to be classified as food insecure. This raises questions about the relationship between food insecurity and having minimal household resources, as well as the cognitive validity of the screener question and the FSS.

To determine whether the relationship between food insecurity and income has changed over time, we

15 Though food-insecure household heads are more likely than food-secure household heads to have a disability (5.6 percent compared to 1.7 percent), households in the top three income quintiles are less likely to report a disability, irrespective of food security status. For example, in 2022, 2.7 percent of food-insecure household heads in the top three income quintiles reported a disability, compared to 0.8 percent of food-secure household heads.

examine changes in the income distribution by food security status from 2001 to 2022. Depending on changes in the income composition of the food insecure over the past two decades, it is possible that household-level food security status has become a better or worse predictor of economic hardship. For example, if 2022 food-insecure households are less likely to be in the bottom of the income distribution compared to food-insecure households in previous years, then food insecurity has likely become a worse predictor of economic hardship over time, and vice versa.[16]

In Figure 3, we show how the income composition of the food secure, low food secure, and very low food secure has changed from 2001 to 2022. Specifically, for each year, we take the median income of each income group,[17] adjust for geographic variation in cost of living,[18] and then adjust for household size. We then divide each year's FSS sample into quintiles based on their adjusted household incomes. Figure 3, Panel A reports the share of the food secure that belongs to each adjusted household income quintile. Panels B and C do the same for the low food secure and very low food insecure, respectively.[19]

Panel A indicates that the income composition of the food secure has varied little over time. That is, since food security was first measured in 2001, food-secure households have been consistently overrepresented in the top income quintile (between 23 and 25 percent of food-secure adults were in the top quintile) and slightly underrepresented in the bottom income quintile (14 to 17 percent of food-secure adults).

However, the income distribution of both food-insecure groups exhibited notable change over time. First, the share of households with low food security that fell into the bottom of the income distribution declined over time. In 2001, 52 percent of households with low food security were in the bottom income quintile, but by 2022, that share had fallen to 46 percent. (The all-time low was in 2017, when only 43 percent of those with low food security were in the bottom income quintile.) Conversely, the share of the low food secure who have household incomes in the top three quintiles grew from 21 percent to 25 percent over the same period.

These trends were even more apparent among the very low food secure (Panel C). In 2001, 63 percent of the very low food secure were in the bottom income quintile. In 2022, that share had fallen to 53 percent (falling as low as 48 percent in 2018). Conversely, the share of the very low food secure who had household incomes in the top three quintiles grew from 15 percent in 2001 to 21 percent in 2022.

In sum, although low-income households are much more likely than high-income households to be food insecure, a non-negligible share of food-insecure households have incomes that place them in the middle-to-upper end of the income distribution. Moreover, it appears that this trend has intensified in recent years, suggesting that the relationship between food insecurity and household income has weakened over time.

Importantly, these figures reflect self-reported income, not including refundable tax credits and in-kind benefits. Income measures have become less accurate over time (Bee and Rothbaum 2023), and misreported income could affect these trends. For example, if self-reported income has become less reliable for those at the bottom of the income distribution, then the income distribution of the food insecure that we observe in the data could change over time, even if the *real* relationship between food insecurity and income has not changed. Further,

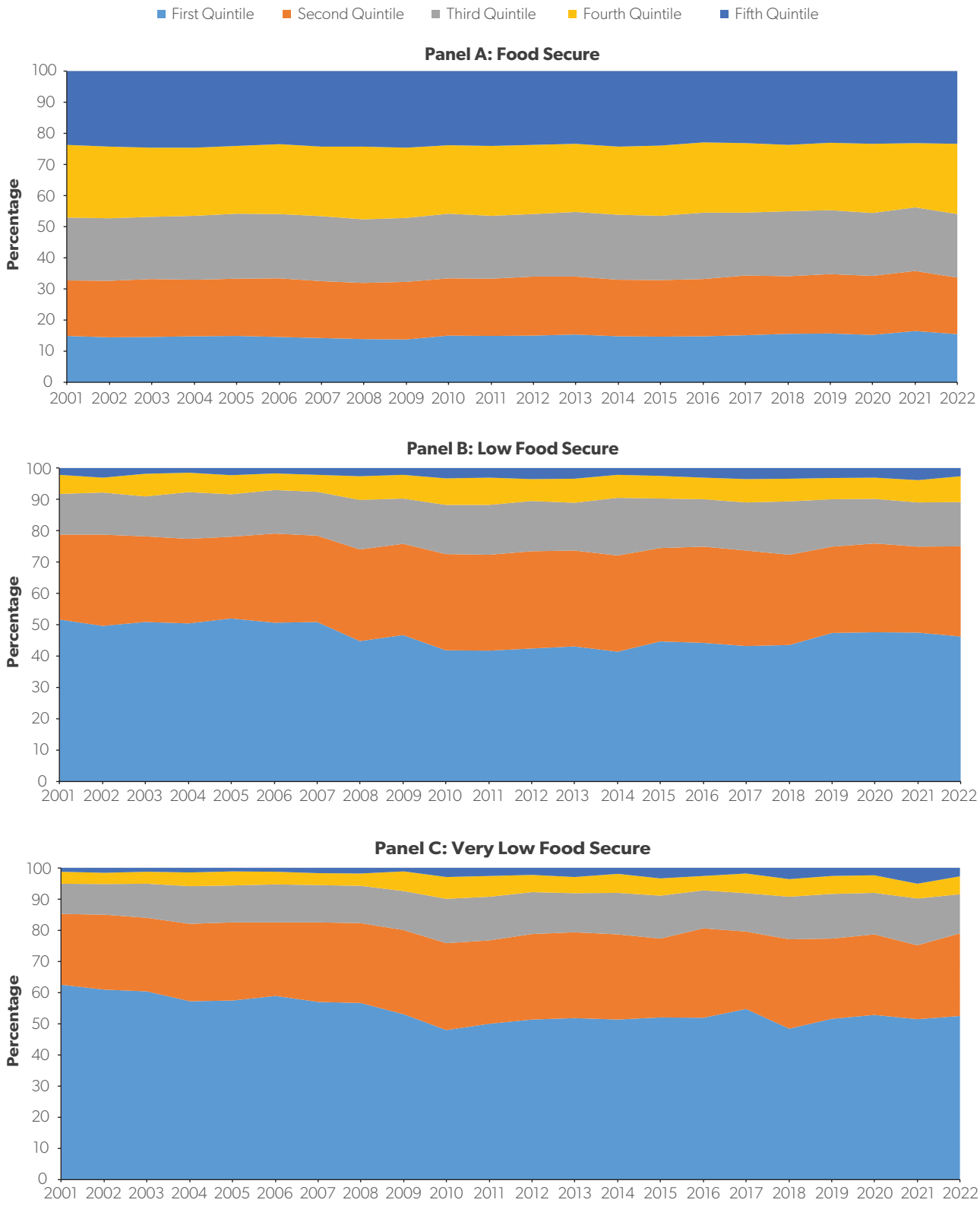
16 It is also possible, however, that our income measures have become less accurate over time. If the CPS becomes less accurate at capturing income—especially for those at the bottom of the income distribution—we could also observe a decoupling relationship between food insecurity and income.

17 Note that in 2001 and 2002, the monthly CPS income variable was top-coded at $75,000. In subsequent years, there are separate income categories for $75,000–100,000, $100,000–150,000, and over $150,000. For respondents who answered as having household incomes greater than $75,000 in 2001 and 2002, we randomly assign households to one of the three income categories found in subsequent years.

18 Note that RPP values are available only from 2008 onward. For missing years 2001–07, we assign each metropolitan statistical area (MSA) an RPP value that is equivalent to the average of the three following years. For example, a given MSA's RPP in 2007 is determined by taking the average RPP for that area in 2008, 2009, and 2010. Also note that we cannot identify RPPs for approximately 1 percent of MSAs due to changing boundaries. Households residing in these areas are excluded from the analyses.

19 Note that these analyses show the relationship between food insecurity and *relative* income, not *absolute income*. Therefore, we are simply showing the share of the food insecure that belong to the household income quintile of each year. We are not showing changes in the real income of the food insecure. However, given that real income has grown substantially over the past 20 years (East, Edelberg, and Steinmetz-Silber 2023), we suspect that the food insecure have improved in absolute economic resources and relative income.

**Figure 3. Percentage in Each Household-Income Quintile by Food Security Status, Adults Age 18 and over, Adjusted for Household Size and Geography, 2001–22**




Source: Authors' calculations from the US Census Bureau (2022).

these figures do not reflect all household resources because they do not capture refundable tax credits and SNAP benefits, resulting in our ability to assess only the relationship between self-reported pretax and transfer income and food insecurity. Notwithstanding these limitations, the existing data suggest that the relationship between income and food insecurity has weakened over time.

**Food Insecurity and Food Expenditures.** Income is not the only factor to consider when examining how self-reported food hardship relates to objective measures of economic well-being. It is also necessary to consider household expenses on food. If food-insecure households disproportionately live in areas with high food prices, then they may fall into food insecurity despite having relatively high incomes.

The CPS FSS asks households about their typical weekly food expenditures. Specifically, it asks respondents to detail their usual weekly food expenditures on all food (including food purchased at grocery stores, restaurants, convenience stores, etc.), which the CPS then rounds to the nearest $10.

The expected relationship between food insecurity and food expenditures is ambiguous. On the one hand, food-insecure households may face unavoidably high food prices. In this case, food-insecure households may spend above-average amounts on food while receiving below-average quantity or quality of food. On the other hand, food-insecure households may be more likely to implement cost-saving strategies in their food purchases. In this case, food-insecure households would have lower food expenditures than would food-secure households. We suspect that for very low food-secure households, the latter effect would dominate, meaning that households with very low food security spend less on food than food-secure households do. Indeed, if households are cutting or skipping meals, we would expect them to spend far less on food than food-secure households.

Just as with income, we show the expenditure distribution for each food security group. (See Figure 4.) The blue shaded area shows the distribution of food expenditures for the very low food secure group, the orange shaded area shows the food-expenditure distribution for the low food-secure group, and the dotted black line shows the trace of the food-expenditure distribution for the food-secure group. Once again, the brown area shows where the two food-insecure expenditure distributions overlap.

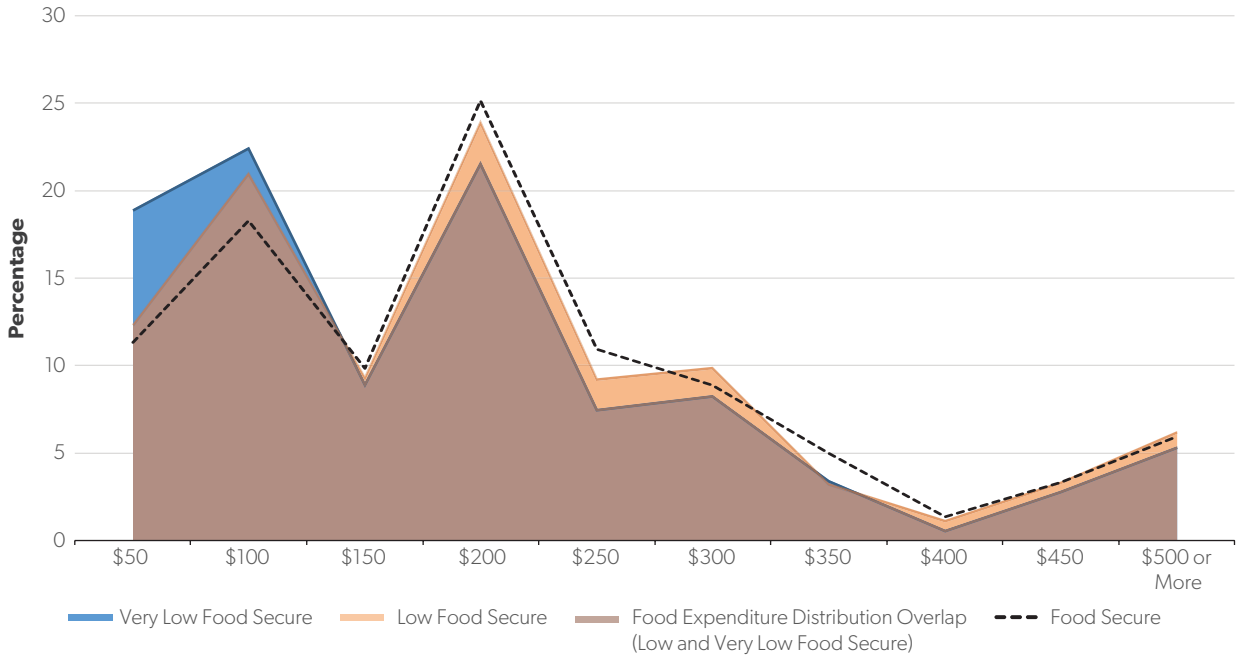
As Figure 4 makes clear, the food-expenditure distributions are virtually indistinguishable from each other. That is, food-insecure households spend about as much on food as the food secure do. To be sure, the very low food secure are overrepresented among the lowest spenders, which leads to differences in average weekly spending. (Food-secure households spend an average of $203.38 per week, and very low food-secure households spend $181.86.) However, both food-insecure groups are about as likely to spend the same amount as the food secure at each expenditure level. In real terms, 21 percent of the very low food secure spend over $250 per week on food, whereas 24 percent of the low food secure and 25 percent of the food secure spend $250 or more per week.

Just as with income, however, gross expenditure levels do not necessarily indicate the amount of food expenditures per person in the household. If food-insecure households disproportionately live in high-cost areas, then their weekly food budget would not afford as much food as it would in a relatively low-cost area. Alternatively, if food-insecure households have more household members than food-secure households do, then their food budget would be stretched over more individuals, reducing the per-person amount of resources available for food.

To account for these possibilities, we implement the same geographic and household-size adjustments as we did in the previous section. After making these adjustments, we once again calculate the food-spending distribution of each food security group and present our results in Figure 5.

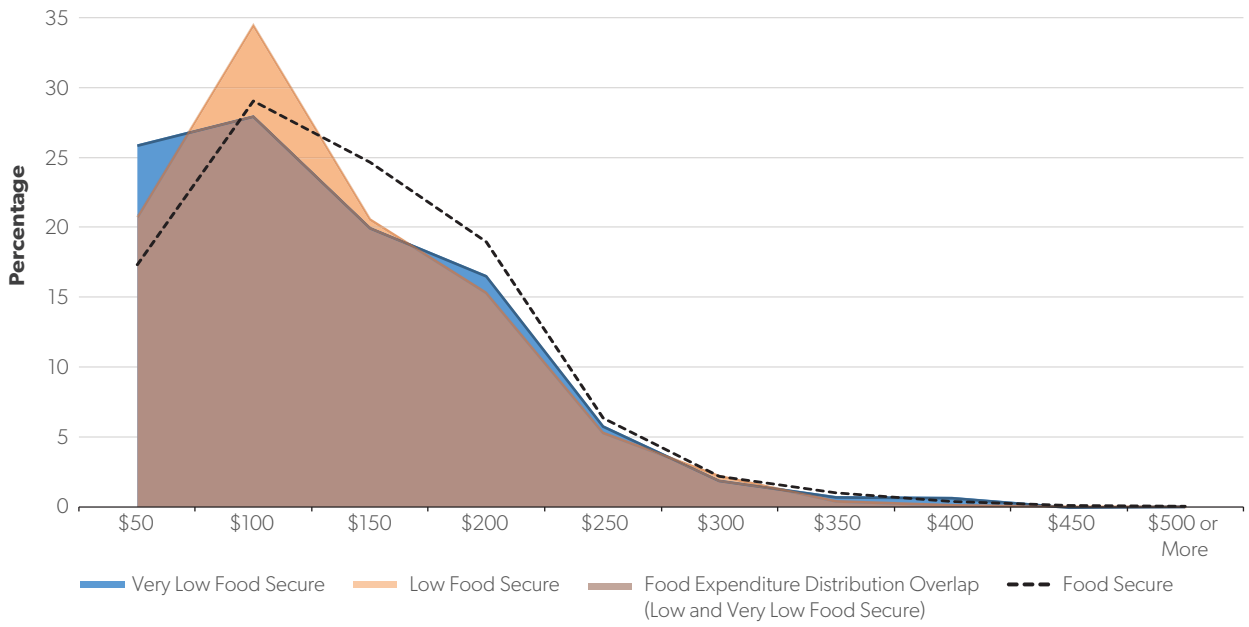
Even after adjusting for cost of living and household size, the distribution of food expenditures among food-insecure households is similar to the distribution among food-secure households. Granted, food-insecure households remain slightly overrepresented at the bottom of the expenditure distribution; the very low food secure and food secure are 1.5 and 1.2 times more likely to be in the bottom expenditure group compared to food-secure households. However, 16 percent of the very low food secure and 18 percent of the low food

**Figure 4. Food-Expenditure Distribution by Food Security Status, Adults Age 18 and over, 2022**




Note: Households are grouped into food-expenditure categories depending on their usual weekly food budget. Expenditure amounts on the x-axis indicate the upper bound of the expenditure interval.
Source: Authors' calculations from the US Census Bureau (2022).

**Figure 5. Adjusted Food-Expenditure Distribution by Food Security Status, Adults Age 18 and over, 2022**




Note: Households are grouped into food-expenditure categories depending on their usual weekly food budget. Expenditure amounts on the x-axis indicate the upper bound of the expenditure interval.
Source: Authors' calculations from the US Census Bureau (2022).

secure are in the top expenditure quintile, compared to 20 percent of food-secure households. In real terms, households in the top expenditure quintile spend at least $163.20 per week per household member. These data suggest that food-insecure households spend about as much per person as food-secure households do on food per week.

These findings align with prior research in the field. For example, Gundersen and Ribar (2011) found a relatively weak negative correlation between food insecurity and usual food expenditures. Other research has found that food-insecure households spend only slightly less on food per week compared to food-secure households (Gregory and Mancino 2019). And most recently, Smith and Gregory (2023) found that food-insecure households consume as many (or more) calories than food-secure households do and that they spend about as much on food as food-secure households do.

In Figure 6, we show how the relationship between food expenditures and food security status has changed over time. Just as with income, for each year from 2001 to 2022, we calculate the same cost of living and household-size adjustment and then divide households into quintiles based on their adjusted food expenditures. Panels A, B, and C plot the share of each food security group that is in each yearly food-expenditure quintile.

Panel A indicates that there has been almost no changes in the expenditure composition of the food secure. From 2001 to 2022, the share of food-secure households with food expenditures in the lowest quintile has oscillated between 19 and 21 percent. At the top end of the expenditure distribution, the share of food-secure individuals in the fifth expenditure quintile varied only between 20 and 22 percent. In other words, for as long as the Census Bureau has measured food security, the food secure have been largely equally represented throughout the food-expenditure distribution.

Panel B, however, indicates that the low food secure have become less likely to be in the bottom quintiles of food expenditures. That is, in 2001, 33 percent of the low food secure were in the bottom food-expenditure quintile. By 2022, that share had fallen to 24 percent. Conversely, the share of the low food secure who were in the top two expenditure quintiles has increased from about a quarter (26 percent) to over a third (34 percent) of the group over the same period. Although gradual change is apparent throughout the entire time series, many of the largest changes are concentrated around the years following the onset of the COVID-19 pandemic.

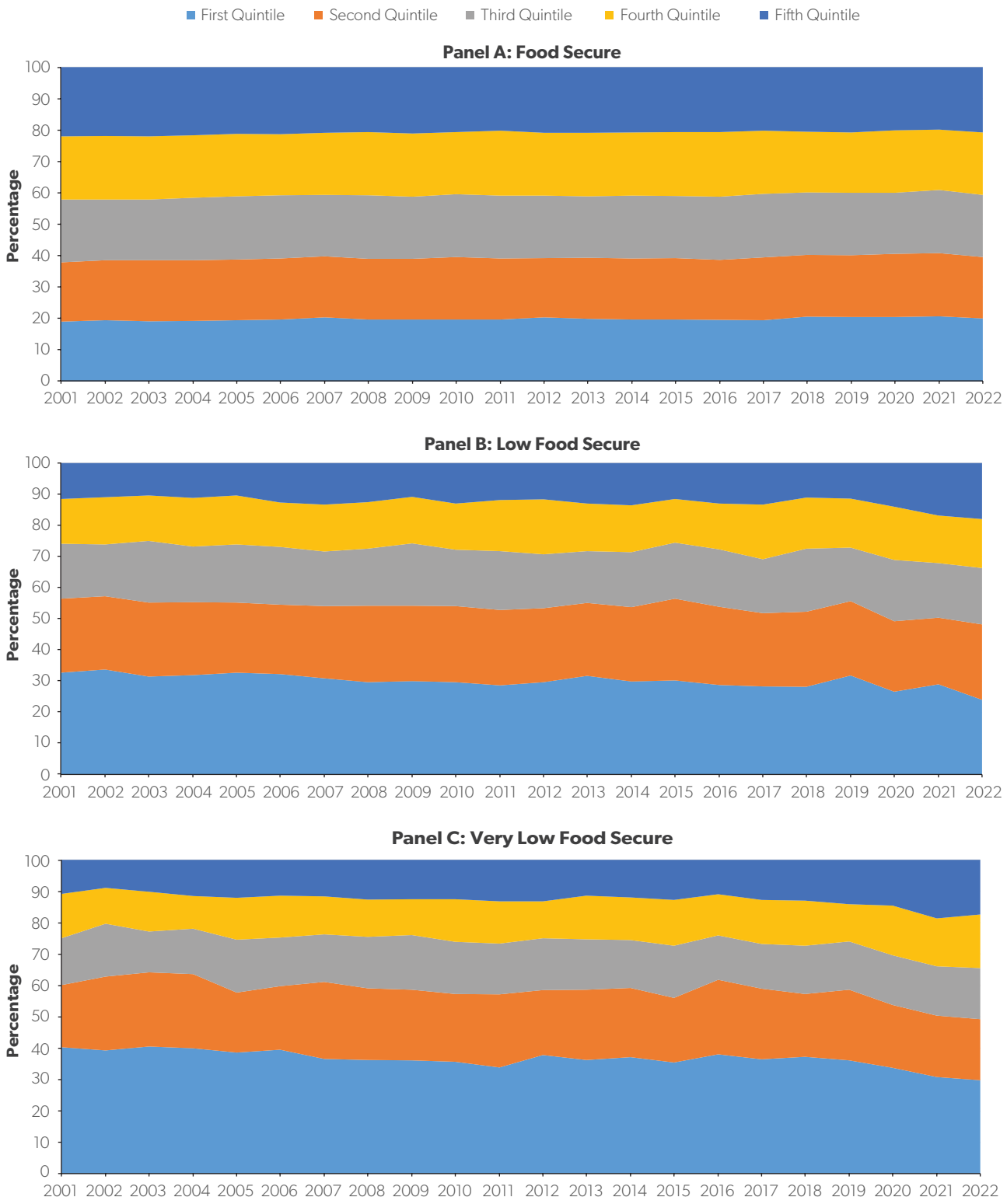
A similar trend emerges for the very low food secure. When food insecurity was first measured in the early 2000s, 40 percent of the very low food secure were in the bottom quintile of food expenditures. In 2022, only 30 percent of the very low food secure were in the bottom quintile. Interestingly, the share of the very low food secure—meaning those who reported several instances of reducing food intake due to financial restrictions—in the top expenditure quintile increased from 11 percent in 2001 to 17 percent in 2022.

In sum, these data indicate that food-insecure households spend about as much on food as food-secure households, even when we adjust for cost-of-living and household size. Much like income, the link between food insecurity and lower food expenditures has weakened over time. These data suggest that either some food-insecure households face unavoidably high food prices—which may drive them into food insecurity in the first place—or food-insecure households perceive more food-related hardship than food-secure households do, despite spending approximately the same on food.[20]

Because the FSS does not allow us to monitor the quantity and types of food that households purchased, we cannot directly assess how certain households can spend such high amounts on food while also reporting food insecurity. Nonetheless, the distribution of food expenditures is approximately the same for food-insecure households as it is for food-secure households, raising questions about whether food insecurity primarily measures food-related anxiety, food preferences, or food-related hardship.

20 Alternatively, it is also possible that the relationship between food security status and income has not changed over time and that our measure of income has become less accurate.

**Figure 6. Percentage in Each Household Food-Expenditure Quintile by Food Security Status, Adults Age 18 and over, Adjusted for Household Size and Geography, 2001–22**




Source: Authors' calculations from the US Census Bureau (2022).

## Conclusion

Accurately measuring hardship is vital for understanding the needs of the most disadvantaged members of society. Many government-published statistics—including income levels, the poverty rate, and the food insecurity rate—allow researchers to identify those in the greatest need of financial assistance, track society's progress over time, and design policies that best alleviate hardship. Those who cannot afford adequate food to feed their families face one of the most severe forms of hardship, a problem that policymakers should treat with the utmost urgency.

Presumably, food-insecure households are resource constrained, and they would therefore have lower incomes and spend less on food. Our analyses suggest that the distribution of income and food expenditures for food-insecure households compared to food-secure households may not be as dissimilar as expected. Many food-insecure households have similar income levels or food-expenditure levels as their food-secure counterparts, raising questions about the meaning of the food insecurity measure.

Specifically, we found that in 2022, 21 percent of the very low food secure and 25 percent of the low food secure were in the top three income quintiles of the income distribution. We also find that a relatively high share of food-insecure households were in the top food-expenditure quintiles, even after adjusting for household composition and geographic variation in cost of living. Lastly, we find that the relationship between food insecurity and each of these measures of economic well-being has weakened over time. Combining food expenditures and household income, we find that 12 percent of the very low food secure and 15 percent of the low food secure are in the top three income quintiles and in the top three food-expenditure quintiles.

These findings have important policy relevance. First, from 2000 to 2022, federal spending on food assistance programs more than tripled from $51 billion to $183 billion in constant dollars (Toossi and Jones 2023). Over the same period, the national food insecurity rate increased from 10.7 percent to 12.8 percent. Moreover, the percentage of American households experiencing very low food security increased from 3.3 percent to 5.1 percent (Rabbitt et al. 2023).

These counterintuitive trends—increasing spending on food assistance and increasing food insecurity—suggest a disconnect between food assistance policy and food insecurity, even though research indicates SNAP reduces food insecurity at the individual household level. Indeed, some of the best research on the relationship between SNAP receipt and food insecurity shows that SNAP can significantly reduce the likelihood that a household is food insecure (Gundersen, Kreider, and Pepper 2017).

The evidence of SNAP's effectiveness in alleviating food insecurity raises important questions about the true meaning of food insecurity and its connection to economic hardship. Our findings suggest that the food insecure in recent years have higher incomes compared to their counterparts in years past. Many of the nation's largest food assistance programs are means-tested, meaning they are available only to households below a certain income level. As a greater share of food-insecure households have incomes that place them above SNAP thresholds, SNAP would necessarily become less effective at addressing the overall household food insecurity rate.

Alternatively, the concept of food insecurity may be disconnected from material resources due to interpretational variation in the FSS. That is, the concepts underlying the food security questions may differ across households due to the subjective nature of the FSS questionnaire. Because many of the questions in the FSS are loosely defined, households' interpretation of food hardship, such as an adequate diet or anxiety about food affordability, may be driving the weak relationship between food insecurity and real material resources.

This might also explain the finding from Gundersen and Ribar (2011) that the "resource gap" (i.e., the difference in what households report they need to afford an adequate diet compared to what they have) is strongly correlated to food insecurity. Recent research indicates that the resource gap has increased in recent years even though material resources to low-income households have also increased (Rachidi and Gundersen 2024). Additionally, perception differences across households could also explain why households with similar incomes and similar food expenditures could respond differently to food security questions. Further, changes in the food insecurity rate over time may be more reflective of

changes in what households think constitutes an "adequate diet" rather than changes in real material hardship.

Measuring subjective anxiety about acquiring adequate food is still informative, but conceptually separating food-related anxiety from food-related hardship is necessary to properly inform policy. To the extent that food insecurity increasingly captures households experiencing food-related anxiety—and this anxiety can fluctuate irrespective of material conditions—then increasing the generosity of food assistance programs may not be the best method to alleviate food insecurity.

Along with continuing to collect food insecurity statistics, the Census Bureau should explore methods to measure and report the real dietary intake of households, which would provide an objective measure of food hardship. By identifying the caloric intake of food-insecure households, we could better assess whether these households need more resources, need improved access to healthy foods, or interpret FSS questions differently than food-secure households do. Methodologies for assessing daily caloric intake are already well-developed and available for representative samples of US households.[21] Many international statistical agencies, such as the United Nations' Food and Agriculture Organization, also collect average daily caloric intake for over 200 countries and offer well-developed measurement techniques that the Census Bureau could implement into the FSS.

Identifying households that have difficulties affording a healthy diet is vital for informing public policy, and ensuring households have enough food to feed their families is a basic measure of well-being. However, researchers could improve measures of food-related hardship by developing additional methods to assess objective food intake throughout the income distribution. By doing so, policymakers and researchers could better assess the effects of food assistance policy and ensure that policies are reaching families with the greatest need. Moreover, policymakers must reconsider the use of food insecurity rates as an appropriate measure of food policy effectiveness. Because to truly help the most vulnerable, we first need a reliable way to identify who they are.

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## About AEI's Center on Opportunity and Social Mobility

The Center on Opportunity and Social Mobility, directed by Scott Winship, conducts rigorous research and develops evidence-based policies aimed at expanding opportunity in America by reducing entrenched poverty, increasing upward mobility, and rebuilding social capital.

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AEI's Perspectives on Opportunity is a policy report series published by the Center on Opportunity and Social Mobility (COSM). Contributions to this series include empirical and theoretical analysis of issues related to opportunity in the United States and evidence-based policy proposals to expand opportunity, promote upward mobility, and strengthen social capital. COSM Deputy Director Kevin Corinth is the editor of Perspectives on Opportunity.

21 For use of the National Health and Nutrition Examination Survey, see Smith and Gregory (2023).

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