Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Economic Research Service

Economic Research Report Number 346

April 2025

County Characteristics Associated With Receipt of Food Boxes Through the Farmers to Families Food Box Program

Keenan Marchesi, Saied Toossi, and Katy Georg

Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Economic Research Service
www.ers.usda.gov

Recommended citation format for this publication:

Marchesi, K., Toossi, S., & Georg, K. (2025). *County characteristics associated with receipt of food boxes through the farmers to families food box program* (Report No. ERR-346). U.S. Department of Agriculture, Economic Research Service.

Cover photo image from Getty Images.

Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Economic Research Service

Economic Research Report Number 346

April 2025

County Characteristics Associated With Receipt of Food Boxes Through the Farmers to Families Food Box Program

Keenan Marchesi, Saied Toossi, and Katy Georg

Abstract

The economic recession induced by the onset of the Coronavirus (COVID-19) pandemic in March 2020 contributed to an increase in food hardship for millions of people. To help alleviate this hardship, USDA created the temporary Farmers to Families Food Box Program. Through this program, USDA contracted with producers, processors, and distributors to package agricultural commodities produced in the United States into boxes (hereafter "food boxes") for delivery to nonprofit organizations (e.g., food banks and pantries) for distribution to people in need. However, evidence about whether and to what extent the program was able to reduce food hardship is limited. This report used administrative and survey data to examine whether counties characterized by greater levels of need (based on measures of their food environment, food access, rates of food hardship, economic conditions, demographic composition, and urbanicity) were more likely to receive food boxes. The program delivered 177.6 million food boxes from May 2020 through May 2021. Counties with larger populations and higher unemployment rates were more likely to receive food boxes throughout the program's operation, as were more metropolitan counties and those with higher poverty rates and shares of non-Hispanic Black and Hispanic populations in round five.

Keywords: food and nutrition assistance, food security, Farmers to Families Food Box Program, COVID-19, charitable foods

Acknowledgments

The authors thank external reviewers and reviewers at USDA, Economic Research Service (ERS), USDA, Agricultural Marketing Service, and USDA, Office of the Chief Economist. They also thank USDA, ERS product coordinator Debbie Rubas; USDA, ERS editors Jeff Chaltas and Casey Keel; and USDA, ERS designer Nick Gioia for layout and design.

About the Authors

Keenan Marchesi is a research agricultural economist at USDA, Economic Research Service (ERS) in the Food Economics Division (FED). Saied Toossi is a former research agricultural economist at USDA, ERS, in FED. Katy Georg is a team lead financial analyst in USDA, Agricultural Marketing Service's Operations Support Division for the Commodity Procurement Program. Keenan and Saied both contributed to the conceptualization of the research question and development of the analytic approach; Katy procured the data and provided guidance; Keenan conducted the analyses; Saied wrote the manuscript; and all authors reviewed the manuscript.

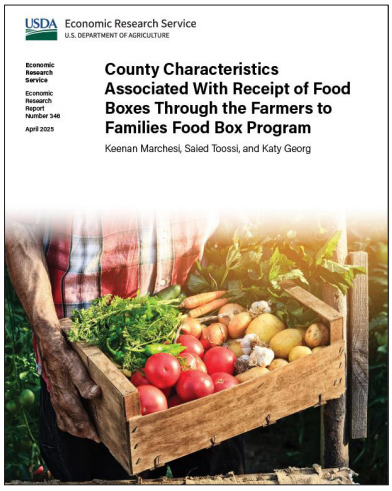
Contents

USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

A report summary from the Economic Research Service *April 2025*

County Characteristics Associated With Receipt of Food Boxes Through the Farmers to Families Food Box Program

Keenan Marchesi, Saied Toossi, and Katy Georg



What Is the Issue?

The onset of the Coronavirus (COVID-19) pandemic in March 2020 forced widespread closures of private businesses, government offices, and nonprofits nationwide. The subsequent economic recession contributed to an increase in food hardship for millions of individuals and families. As a result, many turned to Federal food and nutrition assistance programs and/or charitable food assistance (e.g., food banks and pantries) to meet their food needs. To help support individuals and families, the Federal Government passed legislation in late March 2020 authorizing USDA to create the Farmers to Families Food Box Program (Food Box Program). Through this program, USDA's Agricultural Marketing Service (AMS), the program administering agency, contracted with food producers, processors, and distributors (hereafter "contractors") to package domestically produced agricultural commodities into boxes (hereafter "food boxes") and deliver them to nonprofit organizations (e.g., food banks and food pantries) for distribution to people in need. Making food available in this way may have been particularly important during the pandemic as evidence has suggested that private, charitable food assistance may help to fill gaps in Federal food and nutrition assistance programs. However, evidence about whether and to what extent the Food Box Program was able to reduce food hardship is limited, and there are no data linking the food boxes delivered through the program to individuals or families. Absent such data, this report used administrative and survey data to examine whether counties characterized by greater levels of need (based on measures of their food environment, food access, rates of food hardship, economic conditions, demographic composition, and urbanicity) were more likely to receive food boxes. In so doing, this report presents new information that can help to inform whether and to what extent the program may have helped to reduce food hardship.

What Did the Study Find?

- From May 2020, when the Food Box Program began operating, through May 2021, when the program concluded, 177.6 million food boxes were delivered across five rounds of contracts (each covering a different number of weeks) at a cost of $5.5 billion.

- Nearly 78 percent of all U.S. counties received food boxes at some point during the program's duration. Only five States and two territories had fewer than 50 percent of their counties receive at least one food box.
- The program reached the most counties in round two (July 1–September 18, 2020), when food boxes were delivered to 57.6 percent of all counties and reached the fewest counties in round four (November 1–December 31, 2020), when food boxes were delivered to 28.4 percent of all counties. About one-fifth of the counties that received food boxes received them in all five rounds of the program.
- Across rounds one through four, counties were more likely to receive food boxes the greater their (1) population; (2) share of households receiving Supplemental Nutrition Assistance Program benefits with low access to food retailers; (3) unemployment rate; and (4) share of non-Hispanic Black residents. Counties with a greater share of low-income residents with low access to stores were less likely to receive food boxes.
- In round five, when the program began prioritizing the delivery of food boxes to economically distressed communities, counties were more likely to receive food boxes the greater their (1) population; (2) poverty and unemployment rates; and (3) shares of Hispanic and non-Hispanic Black households, population groups more likely to experience poverty and food hardship. Nonmetropolitan counties adjacent to a metropolitan area were less likely to receive food boxes relative to metropolitan counties.

How Was the Study Conducted?

This study used publicly available information about the Food Box Program to describe the program. The authors used administrative data on the program from August, October, and December 2021 provided by USDA, Agricultural Marketing Service to examine trends in the contents and numbers of food boxes delivered, and program expenditures, and assess how the program's food boxes were distributed across States and counties. These data were supplemented by data from the USDA's Rural-Urban Continuum Codes, Food Environment Atlas, Food Access Research Atlas, and Atlas of Rural and Small-Town America; the American Community Survey, 5-year estimates; and Feeding America's Map the Meal Gap. This study used difference-in-means tests and regression analyses to determine the association between county characteristics and the receipt of food boxes.

County Characteristics Associated With Receipt of Food Boxes Through the Farmers to Families Food Box Program

Introduction

The onset of the Coronavirus (COVID-19) pandemic in March 2020 forced widespread closures of private businesses, government offices, and nonprofits nationwide. The subsequent economic recession contributed to an increase in food hardship for millions of individuals and families (Restrepo et al., 2021; Ziliak, 2021). As a result, many turned to Federal food and nutrition assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP) (Toossi et al., 2021) and/or private, charitable food assistance (e.g., food banks and pantries) to meet their food needs (Byrne & Just, 2022). The latter source may have been particularly helpful in alleviating food hardship during the pandemic, as evidence suggests that private, charitable food assistance may help fill gaps in SNAP participation (Byrne & Just, 2021). In June 2020, 14.5 percent of lower income households and households experiencing food hardship reported receiving charitable food (Ziliak, 2021).

In response to the hardships faced by individuals and families, Congress passed legislation providing USDA with additional funding and flexibility for its food and nutrition assistance programs. As part of this effort, USDA created the Farmers to Families Food Box Program (Food Box Program), which operated from May 2020 to May 2021. Through this program, USDA contracted with eligible producers, processors, and distributors[1] (hereafter "contractors") to purchase domestically produced agricultural commodities, package them in boxes (hereafter "food boxes"), and transport those boxes to nonprofit organizations (e.g., food banks and food pantries; hereafter "recipient organizations") for distribution to families in need. Little is known about whether and to what extent the program was able to reduce food hardship.

A primary challenge is the absence of data linking the agricultural commodities delivered through the Food Box Program to individuals or families. This study used an alternative approach that examined whether counties characterized by greater levels of need (based on measures of their food environment, food access, rates of food hardship, economic conditions, demographic composition, and urbanicity) were more likely to receive agricultural commodities through the program. For example, research has shown that Hispanic and non-Hispanic Black households were more likely to experience poverty and food hardship than their non-Hispanic White and non-Hispanic Asian counterparts (Creamer et al., 2022; Hales & Coleman-Jensen, 2024), and that food hardship has been higher in the principal cities of a metropolitan statistical area and in nonmetropolitan areas than areas outside of a principal city but within a metropolitan area (Coleman-Jensen et al., 2021; Coleman-Jensen et al., 2022). As such, counties with a greater share of Hispanic and non-Hispanic Black households, as well as metro, nonmetropolitan, and nonmetro adjacent counties may have had more individuals and families in need and, therefore, were more likely to receive food from the Food Box Program than other counties.

[1] Producers of agricultural commodities grow or raise raw products (e.g., vegetables or cattle). Processors transform raw products into more finished goods (e.g., converting fresh peaches to canned or frozen peaches). Distributors purchase raw products from producers, or more finished products from processors, and sell them to food service providers (e.g., schools or restaurants) or food retailers (e.g., grocery stores).

This report used the latest administrative data on the Food Box Program made available by USDA, Agricultural Marketing Service (AMS), the agency that administered the program, supplemented with other data sources. Specifically, it examined whether counties with larger populations, a lower density of grocery retailers, higher shares of households with low food access, higher rates of food insecurity (the share of the population lacking consistent, reliable access to food for an active, healthy life), higher rates of poverty and unemployment, and greater shares of population groups most at risk of experiencing hardship, and more urban or rural counties, were more likely to receive food boxes through the program.

One study conducted by the Government Accountability Office (GAO) found that the Food Box Program delivered food boxes to 78 percent of all counties in the United States, including 89 percent of counties where at least 20 percent of the population lived in poverty (Government Accountability Office (GAO), 2021). Two other USDA, Economic Research Service (ERS) reports also described trends in the program's spending and the number of food boxes delivered through the program (Toossi et al., 2021; Jones et al., 2022). However, none of these reports investigated whether counties with greater levels of need were more likely to receive food boxes. For example, while the GAO report found that 89 percent of counties where at least 20 percent of the population lived in poverty received food boxes, it is unclear whether those counties with higher poverty rates were more likely to receive food boxes than those with comparatively lower rates. This study presents insights into how well the program may have been able to reach counties based on indicators of need by using regression analyses to link the receipt of food boxes across counties to county-level measures of need. In so doing, this report presents information that can help to better understand whether and to what extent the program may have helped to reduce food hardship.

Background

Proposals to purchase agricultural commodities for distribution through intermediaries or to provide direct Federal food assistance to people in need through a food box delivery program predate the COVID-19 pandemic. For example, USDA created the Commodity Supplemental Food Program in 1969, which now provides nutritious food packages to roughly half a million income-eligible adults 60 years of age or older (USDA, Food and Nutrition Service (FNS), 2019). Other programs, such as the Commodity Procurement Program (CPP) (authorized during the Great Depression and administered by USDA, AMS) and The Emergency Food Assistance Program (TEFAP) (authorized in 1981 and administered by USDA, FNS), purchase domestic agricultural commodities for distribution to schools, households, and food banks or other charitable organizations (USDA, FNS, 2020; USDA, FNS, 2023). Similarly, USDA has purchased agricultural commodities from domestic producers for distribution to schools since 1936 through its USDA Foods in Schools program (Ollinger & Guthrie, 2022). More recently, in 2019, USDA funded the Meals to You pilot program in Texas, administered by the Baylor Collaborative on Hunger and Poverty, to assess the feasibility of providing shelf-stable boxes of food via mail directly to lower income households with children in rural areas who may lack reliable access to food during the summer months when most schools are not in session. The program was expanded in 2020 to include households in parts of Alaska and New Mexico (Gutierrez et al., 2022).

In March 2020, in response to the pandemic and its consequences, the Federal Government passed the Families First Coronavirus Response Act (FFCRA) and the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which authorized and funded USDA to create the temporary Food Box Program. Subsequent legislation provided additional funding for the program until it concluded in May 2021 (GAO, 2021). The program was administered in five distinct rounds. USDA, AMS, the agency responsible for administering the

Table 1
Timeline of the implementation of the Farmers to Families Food Box Program

Round	Available funding (U.S. dollars, billions)	Solicitation announced	Contracts announced	Number of contracts awarded	Dollar amount contracted (U.S. dollars, billions)	Number of boxes contracted (millions)	Cost of boxes delivered (U.S. dollars, billions)	Boxes delivered (millions)	Delivery round
1	$3.0	April 24, 2020	May 8, 2020	198	$1.11	52.21	$0.95	35.59	May 15, 2020–June 30, 2020
2		No new solicitation; bids and contracts from previous round awarded or extended	June 17, 2020; July 24, 2020	213	$1.95	83.45	$1.78	66.41	July 1, 2020–September 18, 2020
3	$1.0	July 24, 2020	September 17, 2020	55	$0.92	20.26	$0.86	18.92	September 22, 2020–October 31, 2020
4	$0.5	October 23, 2020	October 30, 2020	32	$0.49	12.49	$0.49	12.47	November 1, 2020–December 31, 2020
5	$1.5	January 4, 2021	January 19, 2021	36	$1.42	44.4	$1.41	44.15	January 19, 2021–May 31, 2021
Totals	**$6.0**			**534**	**$5.89**	**212.81**	**$5.48**	**177.55**	**May 15, 2020–May 31, 2021**

Note: This table presents an overview of the implementation of the Farmers to Families Food Box Program, as well as figures for the total dollar amount and number of food boxes contracted and delivered for the 50 States, Washington, DC, and U.S. territories. All numbers are rounded to the nearest hundredth.

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Food Box Program, began soliciting bids from prospective contractors in April 2020 and awarded the first contracts in May 2020. The periods covered by these rounds and the amount of funding allocated for each are shown in table 1.[2]

[2] For a detailed overview of the Food Box Program's background and rules, see GAO (2021).

To qualify for the receipt of food boxes through the program, prospective recipient organizations must have been operating as not-for-profit (e.g., food banks, food pantries, or faith-based organizations). Government entities, such as school food authorities or Indian Tribal Organizations, could also qualify. Upon receiving food boxes from contractors, recipient organizations were responsible for distributing the food products to those people in need and could do so in whatever manner they chose. This discretion allowed them to deliver food boxes to secondary organizations, including those outside of their locale. There were no reporting requirements for recipient organizations participating in the program.

Contracting Process

Before each round (except for round two), USDA, AMS solicited bids from prospective contractors. Beginning with round two, contractors from a previous round who met their obligations could have their contracts extended. Contractors that failed to do so did not have their contracts renewed. In the first two rounds of the program, prospective contractors could submit offers to provide boxes of fresh fruits, fresh vegetables, dairy products, precooked meats, fluid milk,[3] or a combination of these products. This changed with the solicitation for round three. Beginning with that round, USDA, AMS prioritized the purchase of combination boxes that met specific content requirements. Requirements for combination boxes specified that food boxes contain:

- Ten to twelve pounds of fresh fruits and vegetables. More specifically, 2 to 4 pounds had to be root vegetables, and another 2 to 4 pounds had to be fruits with longer storage life (e.g., citrus, apples, and melons). Additionally, the fruit and vegetable contents of boxes must have included one or two locally grown items, as available.
- Five to six pounds of cheese (Cheddar, swiss, pepperjack, or mozzarella) and one other dairy item (yogurt, butter, sour cream, or cottage or cream cheese), plus the equivalent of 1 gallon of milk (2 percent or whole).
- Five to six pounds of at least two precooked meat items.
- At least 10 pounds of meat and dairy combined.

Also, beginning with the third round, USDA, AMS required that prospective contractors be able to deliver food boxes to larger geographic areas and prioritized proposals that offered the lowest prices. Lastly, for the fifth round, the program aimed to deliver food boxes to recipient organizations in every county or county equivalent in the United States and its territories (American Samoa, Puerto Rico, Guam, the Northern Mariana Islands, and the Virgin Islands), with an emphasis on economically distressed communities (GAO, 2021).[4]

Data

This study used administrative data provided by USDA, AMS on recipient organizations and the content, cost, quantity, and delivery date of food boxes as of August, October, and December 2021.[5] Contractors were asked to report the city, State, county, and ZIP Code of the recipient organizations to which food boxes were

[3] Fluid milk did not include plant-based milks.

[4] More specifically, Opportunity Zones, which are economically distressed communities eligible for tax incentives meant to spur local economic investment and development.

[5] This study used data that was pulled in five batches. Data for round one were pulled on October 7, 2021. Data for round two and its extension were pulled on August 27, 2021, and October 7, 2021, respectively. Data for round three were pulled on October 29, 2021. Lastly, data for rounds four and five were pulled on December 2, 2021.

delivered. The data did not include information about where and to whom contents of food boxes were distributed once delivered to recipient organizations. Examination of these data revealed some misreporting of recipient organization's counties by contractors, which often only reported the city to which food boxes were delivered. This study used ZIP-to-County Crosswalk Files provided by the U.S. Department of Housing and Urban Development (HUD) to identify the appropriate county for each recipient organization.[6] This study used data on recipient organizations and food boxes aggregated to the program round (e.g., round one), State, and county or county equivalent (hereafter "county" or "counties") level for analysis.[7]

The administrative data was supplemented with county-level data (or data aggregated to the county level) from several sources. These included USDA, ERS's Rural-Urban Continuum Codes and data from the agency's Food Environment Atlas, Food Access Research Atlas,[8] and Atlas of Rural and Small-Town America; the American Community Survey, 5-year estimates; and Feeding America's Map the Meal Gap (Gundersen et al., 2022). The Rural-Urban Continuum Codes provided a classification system to distinguish between metropolitan counties by population and by the population of their metropolitan statistical area, and nonmetropolitan counties by population and adjacency to a metro area.[9] The Food Environment Atlas and Food Access Research Atlas provided measures of the food environment, such as the number of food retailers located in a county per 1,000 persons, and of food access, such as the percent of households with low-access to food retailers, respectively. Information on demographic composition (e.g., population and racial and ethnic composition), unemployment and poverty rates, and food insecurity rates came from the Atlas of Rural and Small-Town America, American Community Survey, and Feeding America's Map the Meal Gap,[10] respectively.[11]

Methods

This study first examined the number of all food boxes contracted and delivered through the program, and total program expenditures, to present a national overview of the Food Box Program's reach. It then compared counties that did and did not receive any food boxes across county-level measures of the food environment, food access, rates of food hardship, economic conditions, demographic characteristics, and urbanicity (table A.2). This study used t-tests to identify differences that were statistically significant at conventional

[6] More specifically, this report utilized the U.S. Department of Housing Office of Policy Development and Research-United States Postal Service ZIP Code Crosswalk Files from the second quarter of 2020. Since ZIP Codes often traverse two or more counties, these files contain a set of ratios for each ZIP Code representing the distribution of all addresses, residential addresses, business addresses, and other addresses across the counties that fall within each ZIP Code's geographic area. Recipient organizations with ZIP Codes that covered a single county were assigned to that county using the Crosswalk Files. Those whose ZIP Codes spanned more than one county were manually reviewed and assigned to the correct county using information on the location of recipient organizations found online.

[7] In 2010, there were 3,234 counties or county equivalents across the United States and its territories. Effective July 1, 2013, Bedford City, VA, an independent city, had its status changed to that of a town and was incorporated into Bedford County. This study's analysis utilized 3,233 counties for this reason, and any datasets that did not account for this change were subsequently modified to include it. County equivalents included: parishes in Louisiana; organized boroughs, city and boroughs, municipalities, and census areas in Alaska; municipios in Puerto Rico; districts and islands in American Samoa; municipalities in the Northern Mariana Islands; islands in the Virgin Islands; Washington, DC; Guam; and incorporated places and independent cities in the 50 States.

[8] The Rural-Urban Commuting Codes were developed using data available as of 2013, the Food Environment Atlas included data available as of 2017, and the Food Access Research Atlas included data as of 2019.

[9] Appendix table A.1 describes how counties were classified using the Rural-Urban Continuum Codes. A newer version of USDA, ERS' Rural-Urban Continuum Codes was released in 2023. This analysis was conducted using the 2013 version of these data as the 2013 county coding and classification match that of the time period corresponding to the programs operation.

[10] The food security measures provided by Feeding America in the Map the Meal Gap dataset were estimates derived using known determinants of food insecurity, such as unemployment, poverty, disability, homeownership, and median income, as well as the percentage of the population that is Black or Hispanic, using data from the Current Population Survey (Feeding America, 2022).

[11] Appendix table A.2 describes each measure and its source.

thresholds (P-value < 0.10, P-value < 0.05, and P-value < 0.01). Food environment indicators included the number of grocery stores, convenience stores, and supercenter and club stores (hereafter "food retailers") per 1,000 persons in each county in 2016. Food access indicators included the percent of the population in a county that was low income (i.e., annual family income up to 200 percent of the Federal poverty line) with low access to food retailers (i.e., living more than 1 mile from a food retailer if in an urban area or more than 10 miles if in a rural area) in 2019 and the percent of households receiving SNAP benefits with low access to food retailers in 2019. Food hardship was measured using the estimated percent of households and children experiencing food insecurity in 2020 from Feeding America's Map the Meal Gap. County economic conditions were gauged using the annual average of the monthly unemployment rate in 2020, the average annual poverty rate for the period 2016–20, and the average annual poverty rate among children for the period 2016–20.[12] County demographic characteristics included the share of the population that was Hispanic or non-Hispanic White, Black, Asian, or Native American in 2010 (table A.2). Lastly, counties were classified as either metropolitan (metro); nonmetropolitan (nonmetro), metro adjacent; or nonmetro, not metro adjacent.

Lastly, the comparative analysis was supplemented with regression analyses to better understand which county characteristics were associated with the receipt of food boxes, all other factors being equal. The following probit model was used to link the receipt of food boxes to a selection of the aforementioned measures for counties in the 50 States and the District of Columbia:

$$\mathrm{E}(Receive_i) = \Phi(\beta_1 \boldsymbol{Food\ Environment_i} + \beta_2 \boldsymbol{Food\ Access_i} + \beta_3 \boldsymbol{Economic\ conditions_i} + \beta_4 \boldsymbol{Demographics_i} + \beta_5 \boldsymbol{Urbanicity_i}) + \boldsymbol{S} + \varepsilon_i$$

Three regressions were estimated to account for changes in the program's aims between rounds four and five. Depending on the specification, $Receive_i$ represents whether county i received any food boxes across all five rounds of the program, received any food boxes in rounds one through four, or received any food boxes in round five. $\boldsymbol{Food\ Environment_i}$ is a vector of continuous variables measuring the number of grocery, convenience, and supercenter and club stores per 1,000 persons in each county. $\boldsymbol{Food\ Access_i}$ is a vector of continuous variables measuring the percent of households with low access to food retailers among low-income and SNAP households in each county.[13] $\boldsymbol{Economic\ conditions_i}$ is a vector of continuous variables measuring poverty and unemployment rates in each county.[14] $\boldsymbol{Demographics_i}$ is a vector of continuous variables for the share of each county's population that is Hispanic and non-Hispanic White, Black, Asian, and American Indian or Alaska Native. $\boldsymbol{Urbanicity_i}$ is a vector of indicator variables for whether counties are metro, nonmetro, metro adjacent, and nonmetro, nonmetro adjacent. State-fixed effects, $\boldsymbol{S}$, were also included to account for time-invariant State-specific factors that might have affected the delivery of food boxes and the standard errors were clustered at the State level.

[12] Effective January 2, 2019, the Valdez-Cordova Census Area in Alaska was divided into two new areas, the Chugach Census Area and the Copper River Census Area. Some of the datasets the authors used for this report included only data for the Valdez-Cordova Census Area. To facilitate merging across datasets and the analysis, the authors took the average unemployment, poverty rate, and food insecurity rates in the Chugach Census Area and the Copper River Census Area in the datasets that included them and assigned those values to what would have been the former Valdez-Cordova Census Area. No food boxes were delivered to the Chugach Census Area or the Copper River Census Area through the Food Box Program.

[13] Measures of food hardship were excluded from this analysis because Feeding America's Map the Meal Gap estimates for food insecurity are regression adjusted estimates derived from a set of county-level characteristics similar to those included in this report's models.

[14] The child poverty measure was excluded from the regression analysis due to its high correlation with the measure of the overall poverty rate.

Findings

Food Boxes Contracted and Delivered Nationally

Table 1 documents the number of contracts awarded, and the number of food boxes delivered and their costs, by round. Across all five rounds, contractors delivered about 177.6 million food boxes at a cost of about $5.5. billion. The number of boxes delivered was higher in round two than round one as the number of contractors participating in the program rose. Nearly all the contractors participating in round two had previously participated in round one (192 contractors out of the original 198). The number of boxes delivered fell in round three and again in round four as fewer contractors participated in the program, before increasing again in round five.[15]

Overall, more food boxes (57 percent of all food boxes) were delivered in the first two rounds of the program (about a 4-month period) than in rounds three through five (about an 8-month period). However, costs were nearly equivalent across the two periods despite fewer boxes being delivered in the last three rounds. Table 2 presents the average cost per food box by content across rounds.[16] Combination boxes and boxes of precooked meats were the costliest types of food boxes, followed by boxes of dairy, fruits and vegetables, and fluid milk. Figure 1 presents the number of food boxes delivered in each round by content.[17] While more food boxes were delivered in the first two rounds than the last three rounds, these food boxes were of the less costly variety. Contracts in the first two rounds included deliveries of food boxes containing either dairy products, fluid milk, fresh fruits and vegetables, precooked meats, or any combination thereof. Across both rounds, the costliest food boxes (combination boxes and boxes of precooked meat) comprised only 10.6 percent and 8.4 percent of all food boxes delivered, respectively, while the less costly food boxes (boxes of dairy, fluid milk, and fruits and vegetables) comprised 8.9 percent, 21.6 percent, and 52.6 percent of all food boxes delivered, respectively. In rounds three through five, only the costlier combination boxes were delivered, though the average cost per box declined toward the end of the program.

Table 2
Average cost of food boxes delivered through the Farmers to Families Food Box Program by content across program rounds

Food box content	Program round				
	One	Two	Three	Four	Five
Combination	$60.24	$61.06	$45.71	$38.89	$31.91
Precooked meat	$53.45	$54.93	$0.00	$0.00	$0.00
Dairy	$35.27	$34.82	$25.00	$0.00	$0.00
Fruits and vegetables	$23.49	$22.77	$29.00	$0.00	$0.00
Fluid milk	$5.36	$4.63	$0.00	$0.00	$0.00

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

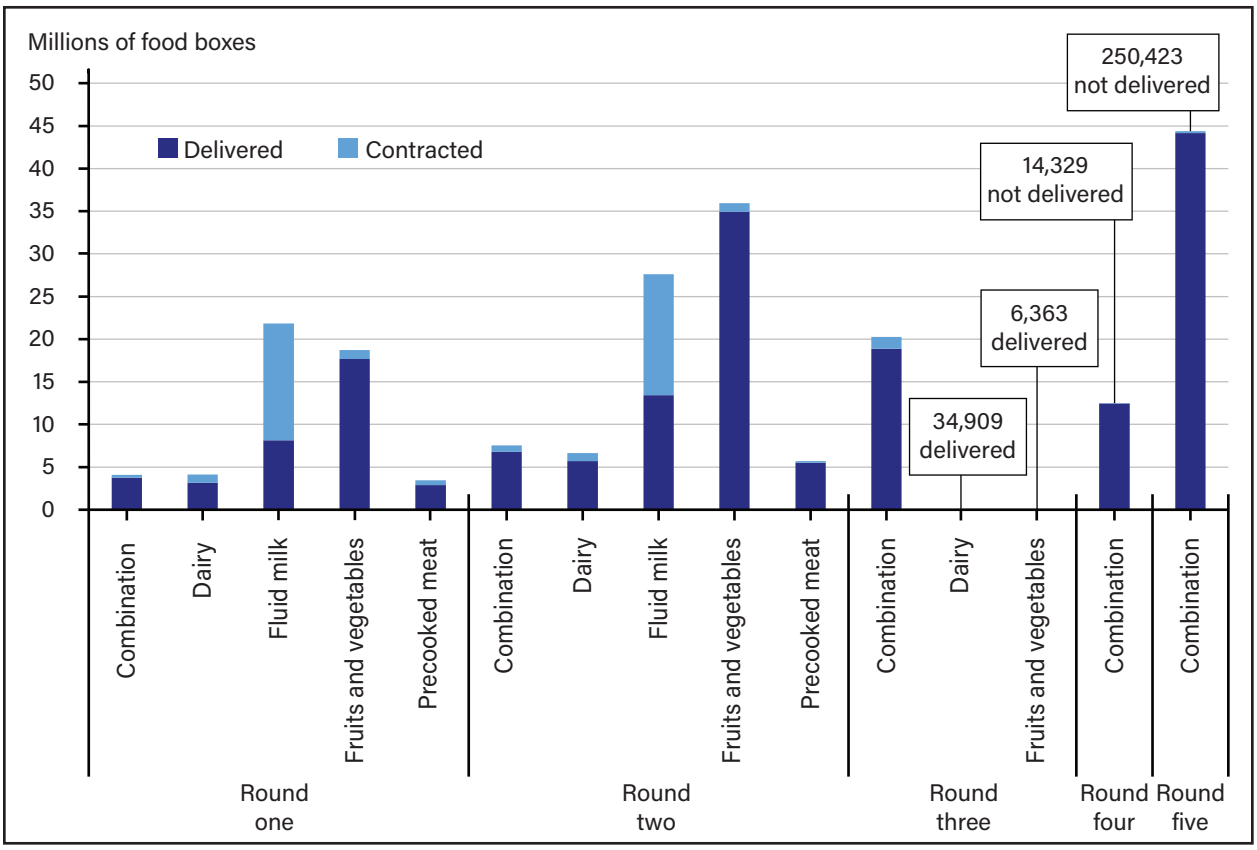
[15] Across all 5 rounds, 255 contractors participated in the Food Box Program. Overall, 42 contractors participated in only 1 of the 5 rounds, 164 participated in 2 rounds, 34 participated in 3 rounds, 13 participated in 4 rounds, and 2 participated in 5 rounds.

[16] The cost of food boxes varied across contractors for numerous reasons, including the geographic areas they served. For example, contractors delivering food boxes to Alaska were required to pay higher transportation costs, which translated to a higher cost per box delivered (GAO, 2021).

[17] Appendix table A.4 presents the exact numbers.

Figure 1 also shows the difference between the number of food boxes contracted and delivered by content and program round.[18] Boxes of fruits and vegetables comprised the largest share of all food boxes contracted in rounds one and two (40.3 percent), and nearly all these contracts were fulfilled (96.2 percent). Conversely, although boxes of fluid milk constituted the second largest share of all boxes contracted in these rounds (36.5 percent), less than half of these boxes were delivered (43.6 percent). Nearly all combination boxes contracted in rounds three through five were delivered.

Figure 1
Number of food boxes contracted and delivered through the Farmers to Families Food Box Program by content and round



Note: The number of food boxes contracted and delivered by round and type are presented in appendix tables A.3 and A.4.

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Distribution of Food Boxes Across States and Territories

Table 3 presents the number of food boxes received by each State and territory, overall and per 1,000 persons, and the share of counties in each State that received boxes. All States and four of the five territories received food boxes (the Northern Mariana Islands received no food boxes). The share of food boxes received of all food boxes delivered was the highest in the three most populous States: California (12.1 percent), Texas (11.3 percent), and Florida (9.4 percent). However, adjusted for population, American Samoa and Puerto Rico received the most food boxes (about 2,272 and 1,534 food boxes per 1,000 persons, respectively), followed by Mississippi (about 943 food boxes per 1,000 persons), Oklahoma (about 898 food boxes per 1,000 persons), Vermont (about 776 food boxes per 1,000 persons), and Florida (about 775 food boxes per 1,000 persons).

[18] The difference in the number of food boxes contracted and delivered by type can be calculated using the information in appendix tables A.3 and A.4.

Table 3

Distribution of food boxes delivered through the Farmers to Families Food Box Program across States, Washington, DC, territories, and counties or county equivalents within States and territories

State/territory/district	Number of food boxes		Food boxes received of total delivered nationally (percent)	Counties that received food boxes (percent)
	Received	Received per 1,000 persons		
Alabama	3,130,972	638.56	1.76	94.03
Alaska	301,998	412.82	0.17	89.66
American Samoa	126,121	2,271.67	0.07	20.00
Arizona	2,696,245	370.43	1.52	100.00
Arkansas	1,814,358	601.22	1.02	69.33
California	21,518,311	544.60	12.11	98.28
Colorado	1,878,439	326.19	1.06	37.50
Connecticut	1,367,790	383.64	0.77	100.00
Delaware	323,599	332.32	0.18	100.00
Florida	16,650,876	775.26	9.40	88.06
Georgia	6,485,978	610.88	3.65	91.19
Guam	35,223	221.03	0.02	100.00
Hawaii	755,284	533.44	0.43	80.00
Idaho	772,220	432.12	0.43	97.73
Illinois	7,530,492	594.27	4.24	81.37
Indiana	4,259,140	632.65	2.40	83.70
Iowa	1,005,490	318.69	0.57	95.96
Kansas	1,305,290	448.04	0.74	48.57
Kentucky	1,986,309	444.60	1.12	75.83
Louisiana	2,580,693	555.13	1.45	84.38
Maine	417,537	310.62	0.24	100.00
Maryland	3,080,027	509.46	1.73	95.83
Massachusetts	2,110,264	306.17	1.19	92.86
Michigan	6,906,072	691.52	3.89	95.18
Minnesota	1,653,019	293.11	0.93	71.26
Mississippi	2,806,619	943.04	1.58	97.56
Missouri	4,304,819	701.40	2.42	84.35
Montana	547,759	512.51	0.31	46.43
Nebraska	902,199	466.40	0.51	67.74
Nevada	1,230,965	399.64	0.69	88.24
New Hampshire	311,477	229.08	0.18	100.00
New Jersey	3,044,757	342.79	1.71	100.00
New Mexico	1,223,106	583.31	0.69	72.73
New York	7,822,267	402.10	4.40	83.87
North Carolina	4,767,030	454.52	2.68	92.00
North Dakota	304,628	399.74	0.17	83.02
Northern Mariana Islands	N/A	N/A	0.00	0.00
Ohio	4,990,090	426.90	2.81	90.91

continued on next page ►

◄ continued from previous page

State/territory/district	Number of food boxes		Food boxes received of total delivered nationally (percent)	Counties that received food boxes (percent)
	Received	Received per 1,000 persons		
Oklahoma	3,552,414	897.76	2.00	67.53
Oregon	1,996,428	473.34	1.12	75.00
Pennsylvania	7,224,704	564.34	4.07	88.06
Puerto Rico	4,899,642	1,534.16	2.76	100.00
Rhode Island	272,045	256.80	0.15	100.00
South Carolina	1,913,115	371.57	1.08	97.83
South Dakota	560,724	633.83	0.32	92.42
Tennessee	2,994,165	438.44	1.69	81.05
Texas	20,102,901	693.30	11.32	55.51
Utah	694,178	216.53	0.39	55.17
Vermont	484,066	775.76	0.27	100.00
Virgin Islands	65,813	618.51	0.04	66.67
Virginia	2,570,949	301.21	1.45	38.35
Washington	3,673,948	482.47	2.07	74.36
Washington, DC	425,046	602.26	0.24	100.00
West Virginia	650,718	363.09	0.37	67.27
Wisconsin	2,301,765	395.33	1.30	87.50
Wyoming	219,226	378.79	0.12	43.48

N/A = Not any.

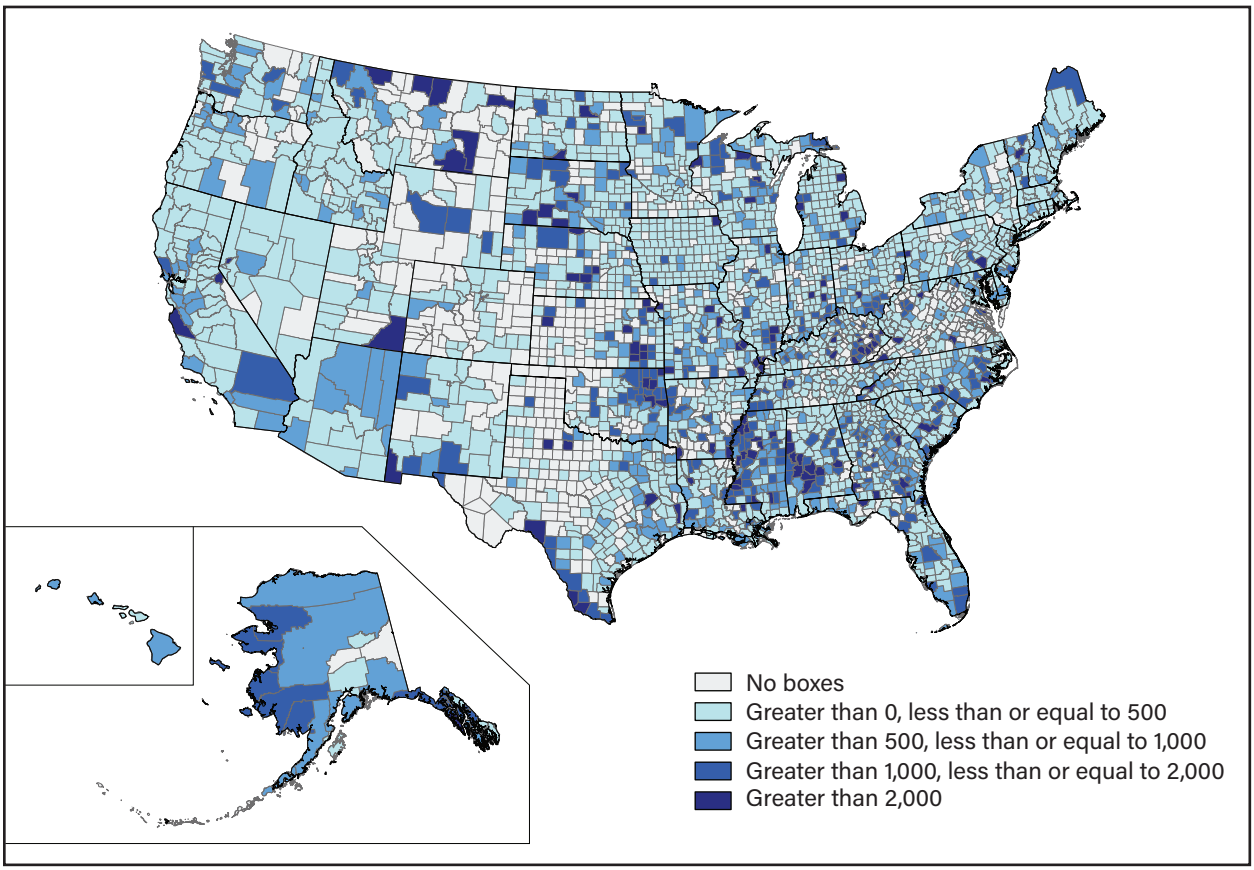
Source: USDA, Economic Research Service (ERS) calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021; and 2019 population data from USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition.

At least 75 percent of counties received food boxes at some point during the Food Box Program's operation in 36 States and 2 territories. Among these, all counties received food boxes in eight States (i.e., Arizona, Connecticut, Delaware, Maine, New Hampshire, New Jersey, Rhode Island, and Vermont) and two territories (i.e., Guam and Puerto Rico). Washington, DC, comprising a single geographic unit, also received food boxes. Among the remainder, between 50 and 75 percent of counties received food boxes in nine States (i.e., Arkansas, Minnesota, Nebraska, New Mexico, Oklahoma, Texas, Utah, Washington, and West Virginia) and one territory (i.e., the Virgin Islands), and less than 50 percent in five States (i.e., Colorado, Kansas, Montana, Virginia, and Wyoming) and two territories (i.e., American Samoa and Northern Mariana Islands).

Figure 2 shows how food box deliveries were distributed across counties in the 50 States. Among all 3,233 counties in the 50 States, Washington, DC, and U.S. territories, 77.9 percent received food boxes at some point during the program's duration. However, although most counties received food boxes at some point, not all counties received them in each round. Figure 3 presents the percent of counties that received food boxes by round. The Food Box Program reached the most counties in round two (when food boxes were delivered to 57.6 percent of all counties) and the fewest counties in round four (when food boxes were delivered to 28.4 percent of all counties). The program reached about half of all counties in rounds one, three, and five. Among all counties, 22.1 percent never received food boxes, 17.8 percent received food boxes in only one round, 15.2 percent received food boxes across two rounds, 13.1 percent received food boxes across three rounds, 13.8 percent received food boxes across four rounds, and 18.0 percent received food boxes across five rounds.

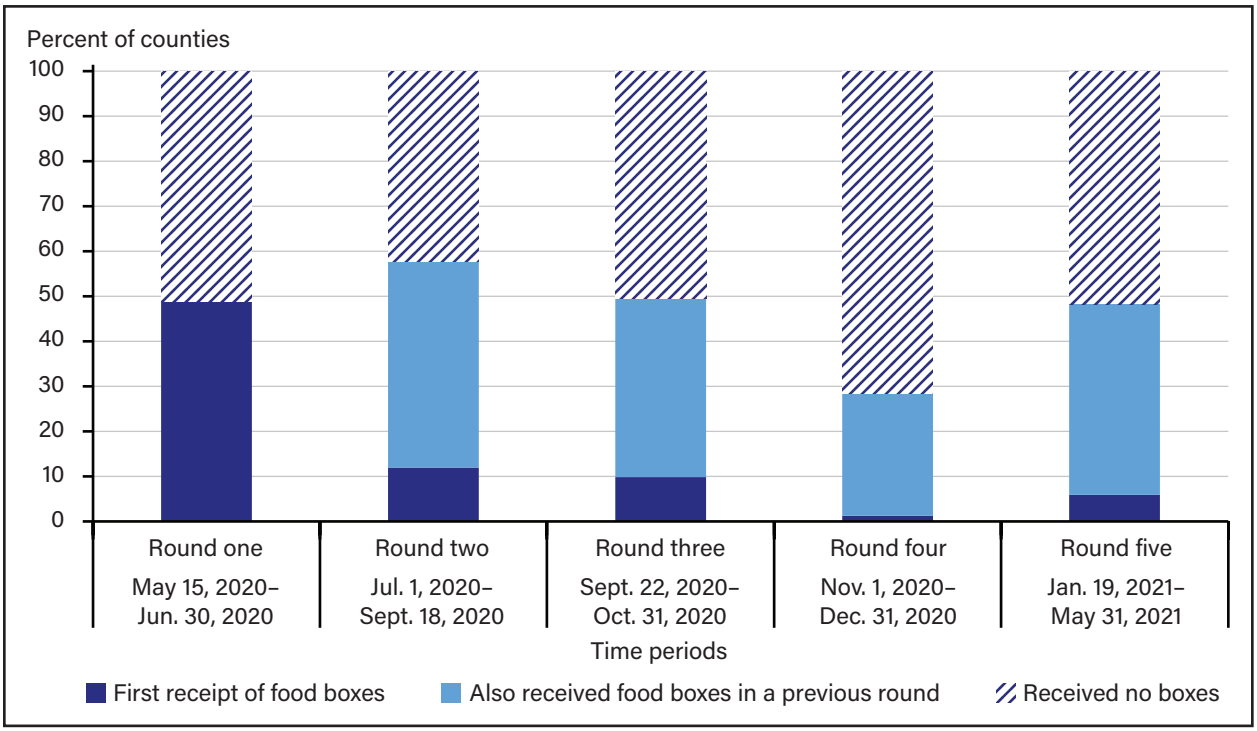
Figure 2

Number of food boxes per 1,000 persons received through the Farmers to Families Food Box Program across counties in the 50 States and Washington, DC



Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Figure 3
Percent of counties that received food boxes through the Farmers to Families Food Box Program by program round



Note: This figure presents the percent of the 3,233 counties that received food boxes through the Farmers to Families Food Box Program by program round. The bars indicate whether a county received food boxes for the first time, had also received food boxes in a previous round, or did not receive any food boxes.

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

County Characteristics Associated With Receipt of Food Boxes

That some counties received food boxes while others did not may reflect differences in each county's food environment, food access, rates of food hardship, economic conditions, demographic composition, or urbanicity. Table 4 compares, on average, the characteristics of counties that did and did not receive food boxes. Counties that received food boxes had fewer grocery and convenience stores per 1,000 persons, but a smaller share of low-income households with low access to food retailers, relative to counties that did not receive food boxes. Counties that received food boxes also had higher unemployment, poverty, and food insecurity rates, including higher rates of child poverty and food insecurity, and higher shares of non-Hispanic Black, Asian, and American Indian and Alaska Native populations. These counties were also more likely to be metro counties and less likely to be nonmetro, nonmetro adjacent counties.

Table 4

Comparison of county characteristics by receipt of food boxes through the Farmers to Families Food Box Program

Characteristics	Did not receive			Received			Difference between counties that did and did not receive food boxes
	Estimate	Standard error	Number of counties	Estimate	Standard error	Number of counties	
A. Food environment							
Number of food retailers per 1,000 persons, 2016							
Grocery	0.33	0.01	707	0.22	0.00	2,435	-0.11***
Convenience	0.69	0.02	707	0.57	0.01	2,435	-0.12***
Supercenters and club stores	0.01	0.00	707	0.02	0.00	2,435	0.01***
B. Food access							
Percent low income and low access to food retailers, 2019	10.26	0.39	707	7.92	0.13	2,435	-2.34***
Percent SNAP households, low access to food retailers, 2019	2.84	0.13	707	2.94	0.06	2,435	0.18
C. Food hardship							
Food insecurity rate, 2020	12.08	0.14	707	12.5	0.07	2,435	0.45***
Child food insecurity rate, 2020	16.6	0.22	707	17.4	0.13	2,435	0.74***
D. Economic conditions							
Unemployment rate, 2020	5.88	0.08	706	6.99	0.05	2,435	1.11***
Poverty rate, 2016–20	13.8	0.23	707	15.82	0.17	2,513	1.98***
Child poverty rate, 2016–20	18.47	0.40	706	21.3	0.24	2,513	2.84***
E. Demographic							
Percent non-Hispanic, 2010							
White	81.65	0.68	707	77.32	0.41	2,435	-4.33***
Black	5.64	0.45	707	9.65	0.30	2,435	4.01***
Asian	0.58	0.06	707	1.3	0.05	2,435	0.72***
American Indian and Alaska Native	0.92	0.09	707	2.15	0.17	2,435	1.23***
Percent Hispanic, 2010	9.8	0.56	707	7.85	0.26	2,435	-1.95***
F. Urbanicity							
Percent metro	20.73	1.52	714	43.19	0.99	2,517	22.45***
Percent nonmetro, metro adjacent	32.77	1.76	714	31.78	0.93	2,517	-0.99
Percent nonmetro, nonmetro adjacent	46.49	1.87	714	25.03	0.86	2,517	-29.77***

SNAP = Supplemental Nutrition Assistance Program. Metro = Metropolitan. Nonmetro = Nonmetropolitan.

Note: This table presents summary statistics by whether counties received any food boxes. Data for select characteristics were not available for all counties. Difference in means evaluated using t-tests. Asterisks denote statistical significance (*** p-value < 0.01).

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

How these differences influenced the likelihood of receiving food boxes among counties were explored further using regression analyses linking the receipt of food boxes to select county-level measures of the food environment, food access, economic conditions, demographic composition, and urbanicity. Table 5 presents the results from probit models across all five rounds of the program and separately for rounds one through four and round five. These results show the direction of the relationships between each characteristic and the likelihood of receiving food boxes. The corresponding average of the marginal effects for each characteristic are presented in appendix table A.5. These results show the magnitudes of the relationships between each characteristic and the likelihood of receiving food boxes.[19]

Across all five rounds, more populous counties were more likely to receive any food boxes, as were those with higher unemployment and poverty rates, a higher share of SNAP households with low access to food retailers, and a greater share of non-Hispanic American Indian or Alaska Native residents. Counties with higher shares of low-income households with low access to food retailers were less likely to receive food boxes. Beginning with round five, the program prioritized the delivery of food boxes to economically distressed communities. Therefore, the likelihood of receiving food boxes may have been different in rounds one through four than round five.

Focusing on rounds one through four, counties were more likely to receive food boxes the greater their overall population, share of SNAP households with low access to food retailers, unemployment rates, and non-Hispanic Black population. As before, counties were less likely to receive food boxes the greater their share of low-income households with low access to stores.

Some of these relationships changed in round five. Counties with greater shares of low-income households with low access to stores and SNAP households with low access to stores were no more or less likely to receive food boxes than those with smaller shares. Notably, whereas poverty rates and the share of the population that was Hispanic were not associated with the likelihood of receiving food boxes in rounds one through four, counties were more likely to receive food boxes the greater their poverty rates and share of the population that was Hispanic in round five. Additionally, nonmetro, metro adjacent counties were less likely to receive food boxes than metro counties. As in previous rounds, counties with larger populations, higher unemployment rates, and larger shares of non-Hispanic Black residents were still more likely to receive food boxes.

Together, these findings suggest that the food boxes were delivered to counties with higher poverty and unemployment rates and greater shares of non-Hispanic Black populations and, beginning with round five, greater shares of Hispanic populations. More urban and rural counties were no more or less likely to receive food boxes relative to their more suburban counterparts, and more urban counties were more likely to receive food boxes than more suburban counties in round five. To the extent that these county characteristics were correlated with the characteristics of individuals and families that relied on food boxes delivered through the Food Box Program, the results provide evidence that the program was able to reach those people in need.

[19] The marginal effect of a characteristic of interest represents the percentage point change in the likelihood of receiving food boxes for each percentage point change in the characteristic, when values for all other characteristics are set to their sample average.

Table 5

Regression results for the receipt of food boxes through the Farmers to Families Food Box Program across counties over all rounds, in rounds one through four and round five

Characteristics	Program round		
	All	One–four	Five
Population (natural log)	0.787***	0.787***	0.610***
	(0.072)	(0.059)	(0.045)
Grocery stores per 1,000 persons	-0.044	0.020	0.184
	(0.186)	(0.205)	(0.202)
Convenience stores per 1,000 persons	0.035	0.061	0.099
	(0.132)	(0.132)	(0.128)
Supercenters and club stores per 1,000 persons	1.445	0.766	-0.640
	(1.734)	(1.811)	(1.407)
Low income, low access to stores (percent)	-0.029***	-0.023***	-0.014
	(0.009)	(0.007)	(0.009)
SNAP households, low access to stores (percent)	0.077***	0.069***	0.034
	(0.024)	(0.020)	(0.024)
Poverty rate, 2016–20	0.019***	0.008	0.027***
	(0.007)	(0.007)	(0.007)
Unemployment rate, 2020	0.059***	0.056**	0.079***
	(0.022)	(0.024)	(0.023)
Percent non-Hispanic Black	0.005	0.008*	0.015***
	(0.005)	(0.005)	(0.003)
Percent non-Hispanic Asian	-0.015	-0.019	0.032
	(0.015)	(0.013)	(0.027)
Percent non-Hispanic American Indian or Alaska Native	0.038**	0.021	0.016
	(0.016)	(0.013)	(0.011)
Percent Hispanic	0.002	-0.003	0.007**
	(0.003)	(0.003)	(0.004)
Nonmetro, metro adjacent	0.026	0.110	-0.117*
	(0.105)	(0.084)	(0.066)
Nonmetro, nonmetro adjacent	0.113	0.127	0.051
	(0.098)	(0.109)	(0.083)
Observations	3,044	3,070	3,127
Pseudo R-squared	0.39	0.38	0.31

SNAP = Supplemental Nutrition Assistance Program. Metro = Metropolitan. Nonmetro = Nonmetropolitan.

Note: This table presents the results from probit model regressions linking the receipt of food boxes to county characteristics. Each regression includes State fixed effects. The corresponding average of the marginal effects are presented in appendix table A.5. Observations missing data for any of the measures included in the regression were dropped from the analyses. Additionally, counties or county equivalents in States and territories wherein all either received or did not receive food boxes during the program rounds specified were also dropped due to a lack of variation in receipt of food boxes. In the analysis for all rounds, counties or county equivalents in Arizona, Connecticut, Delaware, Washington, DC, Maine, New Hampshire, New Jersey, Rhode Island, Vermont, Guam, and Puerto Rico were dropped. In the analysis for rounds one through four, counties or county equivalents in Arizona, Connecticut, Washington, DC, New Jersey, Rhode Island, Vermont, and Puerto Rico were dropped. In the analysis for round five, counties or county equivalents in Delaware, Washington, DC, New Hampshire, and Guam were dropped. Standard errors were clustered at the State level. Asterisks denote statistical significance (* p-value < 0.1; ** p-value < 0.5; *** p-value < 0.01).

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Conclusion

The onset of the Coronavirus (COVID-19) pandemic in March 2020 led to an increase in food hardship among individuals and families, with many turning to Federal food and nutrition assistance programs and/or private, charitable food assistance to meet their food needs (Toossi et al., 2021; Byrne & Just, 2022). The latter source may have been particularly helpful as evidence suggests that private, charitable food assistance may help fill gaps when Federal nutrition assistance program benefits, like SNAP, run out (Byrne & Just, 2021). To support those people experiencing food hardship, USDA created the temporary Food Box Program to purchase, package, and deliver domestically produced agricultural commodities to nonprofit organizations (e.g., food banks and pantries) for distribution to people in need. Although the program delivered food boxes to most counties, it is unclear whether and to what extent the program was able to reduce food hardship among individuals and families most likely to be in need. Absent data directly linking food boxes to those people who benefited from them, this report used administrative data provided by USDA, AMS aggregated to the county-level and supplemented with other county-level data to examine whether counties characterized by greater need based on measure of their food environment, food access, rates of food hardship, economic conditions, demographic composition, and urbanicity were more likely to receive food boxes through the program. This alternative approach can help to inform the extent to which the program was able to reach counties based on indicators of need, such as local food environment or levels of food hardship.

Across 5 rounds between May 2020 and May 2021, 177.6 billion food boxes were delivered across 77.9 percent of all counties, with at least 75.0 percent of counties in each of 36 States and territories receiving food boxes at some point. Overall, the regression analyses provided evidence that the Food Box Program was able to reach counties with greater need, as counties with higher unemployment and poverty rates and a greater share of SNAP households with low access to food retailers were more likely to receive food boxes across all five rounds of the program. The relationship between county poverty rates and the likelihood of receiving food boxes was concentrated in round five, after the program began prioritizing the delivery of food boxes to economically distressed communities. In that round, counties with higher rates of unemployment were even more likely to receive food boxes, as were those counties with greater shares of non-Hispanic Black and Hispanic residents, which are population groups that disproportionately experience poverty and are more likely to experience food insecurity than their non-Hispanic White and non-Hispanic Asian counterparts (Creamer et al., 2022; Hales & Coleman-Jensen, 2024). In round five, nonmetro, metro adjacent counties were less likely to receive food boxes than metro counties. However, there was no statistically distinguishable difference in the likelihood of receiving food boxes across metro counties and nonmetro, nonmetro adjacent counties. That the program was effective in reaching counties with greater poverty and unemployment may have been a function of the location of the nonprofit organizations that received food boxes and distributed their contents, since these organizations, such as food banks, have tended to be located in or near areas most in need.

However, it is important to note that only about one-fifth of the counties that received food boxes received them in all five rounds of the program. As such, in many counties, food boxes obtained through the program were limited to one or a few points in time. The contents of boxes delivered were also not consistent across rounds. About three-quarters of the food boxes delivered through the program in its first two rounds consisted of either fruits and vegetables or fluid milk. Beginning with round three, the program prioritized combination boxes containing a variety of commodities. While this report provides an overview of where and what type of boxes were delivered, it does not address the additional challenges on-the-ground distributors could have faced (Broab Leib et al., 2021). These combination boxes, while providing families with greater selections of foods, may have posed a different set of challenges for some of the nonprofit organizations receiving them (e.g., lacking or unable to obtain the space and/or equipment necessary to store varied

products safely, such as refrigeration capacity). While this report provides an overview of where and what type of boxes were delivered, it does not address the additional challenges on-the-ground distributors could have faced (Broab Leib et al., 2021). This combination may have included the need to expend greater effort in unpacking combination boxes and storing their varied contents at appropriate temperatures (Broad Leib et al., 2021).

Contractors may have also been affected by changes in the program's priorities that limited the overall number of food boxes delivered through the Food Box Program. Changes to the program's requirements that advantaged contractors that were able to serve larger geographic areas, deliver combination boxes, and able to reach economically distressed communities may have limited the number and types of contractors that could participate, and, consequently, the overall number of boxes delivered. This report identified that combination boxes were also more expensive, on average, than other types of food boxes. The transition to these costlier food boxes may have also limited the overall number of boxes delivered due to funding constraints. While this study presents insights on whether the Food Box Program was able to reach counties based on indicators of need, such as the local food environment or levels of food hardship, future research could investigate these and other related aspects of the program. Notably, this study serves to highlight the importance of collecting more comprehensive data on individuals and families served by the Food Box Program, other similar programs, and food and nutrition assistance programs broadly so as to more directly link their operations to outcomes of interest, such as lowering rates of food hardship.

References

Broad Leib, E. M., Ardura, A., Beckmann, J., King, W., Ciplak, M., Orr, J., & Robitaille, A. (2021). An evaluation of the farmers to families food box program. *Food Law and Policy Clinic*.

Byrne, A. T., & Just, D. R. (2021). The other half: An examination of monthly food pantry cycles in the context of SNAP benefits. *Applied Economic Perspectives and Policy*, *43*(2), 716–731.

Byrne, A. T., & Just, D. R. (2022). Impacts of COVID-19 on food banks. *Choices*, Quarter 1.

Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2021). *Household food security in the United States in 2020* (Report No. ERR-298). U.S. Department of Agriculture, Economic Research Service.

Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2022). *Household food security in the United States in 2021* (Report No. ERR-309). U.S. Department of Agriculture, Economic Research Service.

Creamer, J., Shrider, E. A., Burns, K., & Chen, F. (2022). *Poverty in the United States: 2021* (Report No. P60-277, U.S. Census Bureau, Current Population Reports). U.S. Government Publishing Office.

Feeding America. (2022). *Map the meal gap 2022 technical brief: An analysis of county and congressional district food insecurity and county food cost in the United States in 2020*.

Government Accountability Office. (2021). *USDA Food Box Program: Key information and opportunities to better assess performance*, (Report No. GAO-21-353).

Gundersen, C., Strayer, M., Dewey, A., Hake, M., & Engelhard, E. (2022). *Map the meal gap 2022: An analysis of county and congressional district food insecurity and county food cost in the United States in 2020 and 2019.* Feeding America.

Gutierrez, E., Gupta, P., Waxman, E., Anderson, T., Triplett, T., Hernandez-Lepe, F., & Blagg, K. (2022). *Experiences and outcomes from the 2021 meals-to-you program*. Urban Institute.

Hales, L., & Coleman-Jensen, A. (2024). *Household food insecurity across race and ethnicity in the United States, 2016–21* (Report No. EIB-269). U.S. Department of Agriculture, Economic Research Service.

Jones, J. W., Toossi, S., & Hodges, L. (2022). *Food and nutrition assistance landscape: Fiscal year 2021 annual report* (Report No. EIB-237). U.S. Department of Agriculture, Economic Research Service.

Office of Management and Budget. (2018). *Efficient, effective, accountable: An American budget*.

Ollinger, M., & Guthrie, J. (2022). *Trends in USDA foods ordered for child nutrition programs before and after updated nutrition standards* (Report No. EIB-239). U.S. Department of Agriculture, Economic Research Service.

Restrepo, B., Rabbitt, M., & Gregory, C. (2021). The effect of unemployment on food spending and adequacy: Evidence from coronavirus-induced firm closures. *Applied Economic Perspectives and Policy*, *43*(1), 185–204.

Toossi, S., Jones, J. W., & Hodges, L. (2021). *Food and nutrition assistance landscape: Fiscal year 2020 annual report* (Report No. EIB-227). U.S. Department of Agriculture, Economic Research Service.

U.S. Department of Agriculture, Economic Research Service. (2017). *Rural-urban continuum codes.*

U.S. Department of Agriculture, Economic Research Service. (2021). *Atlas of rural and small-town America*.

U.S. Department of Agriculture, Economic Research Service. (2023). *Food access research atlas*.

U.S. Department of Agriculture, Food and Nutrition Service. (2019). *What is CSFP?*

U.S. Department of Agriculture, Food and Nutrition Service. (2020). *What is the emergency food assistance program?*

U.S. Department of Agriculture, Food and Nutrition Service. (2023). *Selling food to USDA*.

Ziliak, J. P. (2021). Food hardship during the COVID-19 pandemic and great recession. *Applied Economic Perspectives and Policy*, *43*(1), 132–152.

Appendix

Table A.1
Classification of counties based on Rural-Urban Continuum Codes

Codes	Description	Classification	Number of counties
1	Counties in metro areas of 1 million population or more	Metropolitan	472
2	Counties in metro areas of 250,000 to 1 million population		394
3	Counties in metro areas of fewer than 250,000 population		369
4	Urban population of 20,000 or more, adjacent to a metro area	Nonmetropolitan, metro-adjacent	217
6	Urban population of 2,500 to 19,999, adjacent to a metro area		597
8	Completely rural or less than 2,500 urban population, adjacent to a metro area		220
5	Urban population of 20,000 or more, not adjacent to a metro area	Nonmetropolitan, not metro-adjacent	98
7	Urban population of 2,500 to 19,999, not adjacent to a metro area		436
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area		428

Metro = Metropolitan. Nonmetro = Nonmetropolitan.

Note: This table presents USDA, Economic Research Service's (ERS) Rural-Urban Continuum Codes (RUCCs) that were used to classify counties as metropolitan; nonmetropolitan, metro-adjacent; and nonmetropolitan, not metro-adjacent. Two counties, Rose Island in American Samoa and Northern Island Municipality in Northern Mariana Islands, did not have a RUCC classification and were excluded from the analysis.

Source: USDA, ERS, 2013 Rural-Urban Continuum Codes.

Table A.2
Measures used in this study's analysis and their sources

County indicator	Description	Source
A. Food environment (number)		
Grocery stores per 1,000 persons, 2016	Number of grocery stores per 1,000 persons in county	USDA, ERS, Food Environment Atlas
Convenience stores per 1,000 persons, 2016	Number of convenience stores per 1,000 persons in county	USDA, ERS, Food Environment Atlas
Supercenters and club stores per 1,000 persons, 2016	Number of supercenters and club stores per 1,000 persons	USDA, ERS, Food Environment Atlas
B. Food access (percent)		
Of population with low access to stores, 2019	Percent of population living more than 1 mile from a food retailer if in an urban area, or more than 10 miles if in a rural area	USDA, ERS, Food Access Research Atlas
Low income population and low access to stores, 2019	Percent of people in a county with low income and living more than 1 mile from a supermarket or large grocery store if in an urban area, or more than 10 miles from a supermarket or large grocery store if in a rural area	USDA, ERS, Food Access Research Atlas

continued on next page ►

◄ continued from previous page

County indicator	Description	Source
SNAP households with low access to stores, 2019	Percent of housing units in a county receiving SNAP benefits and more than 1 mile from a supermarket or large grocery store in an urban area, or more than 10 miles from a supermarket or large grocery store in a rural area	USDA, ERS, Food Access Research Atlas
C. Food hardship (percent)		
Food insecurity rate, 2020	Percent of people in a county that are food insecure, defined as the lack of consistent, reliable access to food for an active, healthy life	Feeding America, Map the Meal Gap
Child food insecurity rate, 2020	Percent of children (under 18) in a county who are food insecure	Feeding America, Map the Meal Gap
D. Economic conditions		
Unemployment rate, 2020	County unemployment rate	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Poverty rate, 2016–20	County poverty rate	U.S. Department of Commerce, Bureau of the Census (Census Bureau), American Community Survey, 5-year average, 2016–20
Child poverty rate, 2016–20	County poverty rate for children aged 0–17	Census Bureau, American Community Survey, 5-year average, 2016–20
E. Demographics and population (percent)		
Non-Hispanic White, 2010	Percent of the county resident population that is non-Hispanic White	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Non-Hispanic Black. 2010	Percent of the county resident population that is non-Hispanic Black or African American	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Hispanic, 2010	Percent of the county resident population that is of Hispanic origin	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Non-Hispanic Asian, 2010	Percent of the county resident population that is Asian	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Non-Hispanic American Indian, 2010	Percent of the county resident population that is American Indian or Alaska Native	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition
Population, 2019	Population size as of July 1, 2019	USDA, ERS, Atlas of Rural and Small-Town America, 2023 edition

ERS = Economic Research Service. SNAP = Supplemental Nutrition Assistance Program.

Source: USDA, Economic Research Service using the sources listed within the table.

Table A.3

Number of food boxes contracted through the Farmers to Families Food Box Program by content across program rounds

Food box content	Program round					Total
	One	Two	Three	Four	Five	
Combination	4,102,321	7,529,684	20,260,689	12,488,297	44,402,739	**88,783,730**
Dairy products	4,121,474	6,637,849	0	0	0	**10,759,323**
Fluid milk	21,838,452	27,615,258	0	0	0	**49,453,710**
Fresh fruit and vegetables	18,711,212	35,946,172	0	0	0	**54,657,384**
Precooked meat	3,441,058	5,717,887	0	0	0	**9,158,945**
Total	**52,214,517**	**83,446,850**	**20,260,689**	**12,488,297**	**44,402,739**	**212,813,092**

Note: These figures represent the number and type of food boxes contracted through the Farmers to Families Food Box Program across the 50 States, Washington, DC, and U.S. territories. Cells with the number 0 indicate that no food boxes of that type were contracted in that round.

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Table A.4

Number of food boxes delivered through the Farmers to Families Food Box Program by content across program rounds

Food box content	Program round					Total
	One	Two	Three	Four	Five	
(Number of food boxes)						
Combination	3,746,757	6,806,994	18,882,203	12,473,968	44,152,316	**86,062,238**
Dairy products	3,133,627	5,716,356	34,909	0	0	**8,884,892**
Fluid milk	8,129,188	13,438,066	0	0	0	**21,567,254**
Fresh fruit and vegetables	17,677,416	34,922,399	6,363	0	0	**52,606,178**
Precooked meat	2,906,215	5,522,533	0	0	0	**8,428,748**
Total	**35,593,203**	**66,406,348**	**18,923,475**	**12,473,968**	**44,152,316**	**177,549,310**

Note: These figures represent the number and type of food boxes delivered through the Farmers to Families Food Box Program across the 50 States, Washington, DC, and U.S. territories. While the solicitation period for round 3 focused on only combination boxes, some food boxes contracted in earlier rounds were not delivered until the time period covered by round 3. Cells with the number 0 indicate that no food boxes of that type were delivered in that round.

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.

Table A.5

Average of the marginal effects for probit models linking the receipt of food boxes through the Farmers to Families Food Box Program to county characteristics across all rounds, in rounds one through four and round five

Characteristics	Program round		
	All	One–four	Five
Population (natural log)	0.143***	0.166***	0.165***
	(0.010)	(0.010)	(0.010)
Grocery stores per 1,000 persons	-0.008	0.004	0.050
	(0.034)	(0.043)	(0.055)
Convenience stores per 1,000 persons	0.006	0.013	0.027
	(0.024)	(0.028)	(0.035)
Supercenters and club stores per 1,000 persons	0.263	0.161	-0.173
	(0.317)	(0.381)	(0.381)
Low income, low access to stores (percent)	-0.005***	-0.005***	-0.004
	(0.002)	(0.002)	(0.003)
SNAP Households, low access to stores (percent)	0.014***	0.015***	0.009
	(0.004)	(0.004)	(0.007)
Poverty rate, 2016–20	0.004***	0.002	0.007***
	(0.001)	(0.001)	(0.002)
Unemployment rate, 2020	0.011***	0.012**	0.021***
	(0.004)	(0.005)	(0.006)
Percent non-Hispanic Black	0.001	0.002	0.004***
	(0.001)	(0.001)	(0.001)
Percent non-Hispanic Asian	-0.003	-0.004	0.009
	(0.003)	(0.003)	(0.007)
Percent non-Hispanic American Indian or Alaska Native	0.007**	0.004	0.004
	(0.003)	(0.003)	(0.003)
Percent Hispanic	0.000	-0.001	0.002**
	(0.001)	(0.001)	(0.001)
Nonmetro, metro adjacent	0.005	0.023	-0.032*
	(0.019)	(0.018)	(0.018)
Nonmetro, nonmetro adjacent	0.020	0.027	0.014
	(0.018)	(0.023)	(0.022)
Observations	3,044	3,070	3,127
Pseudo R-squared	0.39	0.38	0.31

SNAP = Supplemental Nutrition Assistance Program. Metro = Metropolitan. Nonmetro = Nonmetropolitan.

Note: This table presents the average of the marginal effects from probit model regressions linking the receipt of food boxes to county characteristics. Each regression includes State fixed effects. Observations missing data for any of the measures included in the regression were dropped from the analyses. Additionally, counties or county equivalents in States and territories wherein all either received or did not receive food boxes during the program rounds specified were also dropped due to a lack of variation in receipt of food boxes. In the analysis for all rounds, counties or county equivalents in Arizona, Connecticut, Delaware, Washington, DC, Maine, New Hampshire, New Jersey, Rhode Island, Vermont, Guam, and Puerto Rico were dropped. In the analysis for rounds one through four, counties or county equivalents in Arizona, Connecticut, Washington, DC, New Jersey, Rhode Island, Vermont, and Puerto Rico were dropped. In the analysis for round five, counties or county equivalents in Delaware, Washington, DC, New Hampshire, and Guam were dropped. Standard errors were clustered at the State level. Asterisks denote statistical significance (* p-value < 0.1; ** p-value < 0.5; *** p-value < 0.01).

Source: USDA, Economic Research Service calculations using administrative data provided by USDA, Agricultural Marketing Service as of December 2021.