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The spatial context of food shopping: Understanding how local food access and pricing affect household behavior

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Abstract

Rising rates of food insecurity have led researchers to examine how the local retail food environment affects household food purchases, consumption, and food security. Research has paid particular attention to the presence of "food deserts," areas with low or no spatial access to retail stores, such as supermarkets and large grocery stores, which sell fresh food and groceries at affordable prices. Low spatial access to supermarkets and grocery stores is thought to increase the costs of acquiring food for the household and reduce household food consumption. Few data sources, however, can link local food retailers and pricing, household food purchases, and food insecurity in space. To address these gaps in the literature, this project explores the relationships between household food security, food purchases, food pricing, and the geography of the local retail food infrastructure, using unique public and restricted use data files from the National Household Food Acquisition and Purchase Survey (FoodAPS). Household shopping outcomes are modeled in preliminary analyses reported here as a function of spatial access to retailers. We believe our findings will be of interest to policymakers, advocates, and program executives seeking to improve food security among low-income populations.

Executive Summary

Rising rates of food insecurity have led researchers to examine how the local retail food environment affects household food purchases, consumption, and food security. Research has paid particular attention to the presence of "food deserts," areas with low or no spatial access to retail stores, such as supermarkets and large grocery stores, that sell fresh food and groceries at affordable prices. Low spatial access to supermarkets and grocery stores is thought to increase the costs of acquiring food for the household and reduce household food consumption. Few data sources, however, can link local food retailers and pricing, household food purchases, and food insecurity in space.

To address these gaps in the literature, this project explores the relationships between household food security, food purchases, food pricing, and the geography of the local retail food infrastructure, using unique public and restricted use data files from the National Household Food Acquisition and Purchase Survey (FoodAPS). Data from FoodAPS are used to develop more precise measures of food retailer access and local food pricing than is possible with other data sources. In addition to descriptive analyses that provide key insight into where families shop, what they purchase, and how prices paid compare to other stores in the community, we model household shopping outcomes as a function of spatial access to retailers and the spatial contours of food pricing, with a focus on low-income households and those participating in the Supplemental Nutrition Assistance Program (SNAP).

Our analyses yield several important insights:

- Roughly, 6 in 10 of SNAP-eligible households receive SNAP benefits.
- Over 90 percent of poor and non-poor households report using supermarkets or

superstores as their primary food shopping venue.

- The average household spent $109.91 on food shopping trips during the study week. Poor households spend about $30 less on food shopping trips than the average household; SNAP participants spend about $10 less on food shopping trips than the average household.
- The average FoodAPS household travels 4.1 miles one-way to food stores, roughly 9 to 10 minute drives.
- Black and Hispanic households are much closer to the nearest SNAP supermarket or superstore than white households. Black and Hispanic households also are within 1 mile of about 0.5 more supermarkets and superstores than white households.
- Urban households are much closer to SNAP retailers and concentrations of SNAP retailers than households in suburban and rural areas.
- There are no statistically significant differences in supermarket access across SNAP participants and eligible non-participants.
- When using food purchase data reported in FoodAPS, we find very little differences in the most common food items purchased across different population sub-groups (e.g., poor v. non-poor; SNAP recipients v. eligible non-recipients).
- When using food purchase data reported in FoodAPS, we find no systematic evidence of significant differences in average prices paid by shoppers of different types (e.g., poor v. non-poor; SNAP recipients v. eligible non-recipients).

Apart from their scholarly value, our findings should be of interest to an array of policymakers, advocates, and program executives. Future development of interventions to

enhance food security will benefit from clearer evidence on the roles of local retail food availability and pricing in determining food purchases and food security. Improved understanding of how spatial context shapes food insecurity could translate into more efficient and effective allocation of public program dollars, private capital, and philanthropic resources.

Introduction

Rising rates of food insecurity have led researchers to examine how the local retail food environment affects household food purchases, consumption, and food security. Particular attention has been given to identifying the presence of "food deserts," areas with low or no spatial access to retail stores that sell fresh food and groceries. Proximity to supermarkets or chain grocery stores is a primary concern because these stores carry more fresh food items and lower priced food than other types of retailers.[1] Neighborhoods with concentrations of racial and ethnic minorities and poor persons have been found to have lower levels of access to food retailers than predominately white or more affluent neighborhoods, but research that is more recent suggests there may be less race or class inequality in access to food retailers than previously presumed.[2] There is evidence that households with greater access to food retailers and to more affordably priced food products report better household food outcomes than those with less access.[3] However, because few data sources link local food retailers and pricing,

[1] U.S. Department of Agriculture, Economic Research Service. 2009. "Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences."; Fitzpatrick, Katie and Michele Ver Ploeg. 2010. "On the Road to Food Security? Vehicle Ownership and Access to Food." Paper presented at the Research on Connections between Health and SES Using Panel Study of Income Dynamics (PSID) Data Conference, September 2010.

[2] Gallagher, Mari. 2006. "Examining the Impact of Food Deserts on Public Health in Chicago." Chicago: Mari Gallagher Research & Consulting Group; Moore, Latetia and Ana V. Diez Roux. 2006. "Associations of Neighborhood Characteristics with the Location and Type of Food Stores." *American Journal of Public Health* 96(2): 1-7; Powell, Lisa M., Sandy Slater, Donka Mirtcheva, Yanjun Bao, Frank J. Chaloupka. 2007. "Food Store Availability and Neighborhood Characteristics in the United States." *Preventive Medicine* 44 (2007): 189–95; Raja, Samina, Changxing Ma, and Pavan Yadav. 2007. "Beyond Food Deserts: Measuring and Mapping Racial Disparities in Neighborhood Food Environments." *Journal of Planning Education and Research* 27: 469-82; U.S. Department of Agriculture, Economic Research Service. 2009. "Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences."; Zenk, Shannon N. Amy J. Schulz, Barbara A. Israel, Sherman A. James, Shuming Bao and Mark L. Wilson. 2005. "Neighborhood Racial Composition, Neighborhood Poverty, and the Spatial Accessibility of Supermarkets in Metropolitan Detroit." *American Journal of Public Health* 95(4): 660-67.

[3] Bartfeld, Judith S., Jeong-Hee Ryu, and Lingling Wang. 2010. "Local Characteristics Are Linked to Food Insecurity Among Households With Elementary School Children," *Journal of Hunger & Environmental Nutrition* 5(4): 471-83; Garasky, Steven, Lois Wright Morton, and Kimberly A. Greder. 2006. "The Effects of the

household food purchases, and food insecurity in space, too often we are limited in our ability assess the relationship between access to food retailers, pricing, and food security, especially for race and ethnic minorities, the poor, and other vulnerable households.[4]

To address these critical gaps in the literature, this report explores the relationships between household food security, food purchases, food pricing, and the geography of the local retail food infrastructure for low-income households, using unique public and restricted use data files from the National Household Food Acquisition and Purchase Survey (FoodAPS). Household shopping decisions are modeled as a function of spatial access to retailers and the spatial contours of food pricing near respondents. We also examine how food retailer access and food pricing are associated with the shopping behaviors of households participating in the Supplemental Nutrition Assistance Program (SNAP) versus those who are eligible for SNAP but who do not participate. Work reported here reflects preliminary analyses.

Our study improves upon existing research in a number of ways. First, the FoodAPS contains the geographically sensitive information about store pricing and sales, food purchases, and respondent households necessary to develop more precise measures of food retailer access and local food pricing than is possible with other data sources. Data from FoodAPS also

Local Food Environment and Social Support on Rural Food Insecurity." *Journal of Hunger & Environmental Nutrition* 1(1): 83-103; Gibson, Diane M. 2012. "The Neighborhood Food Environment, Food Stamp Program Participation, and Weight-Related Outcomes of Low-Income Women." University of Wisconsin Institute for Research on Poverty Discussion Paper, No. 1406-13; Leibtag, Ephraim and Aylin Kumcu. 2011. "The WIC Fruit and Vegetable Cash Voucher: Does Regional Price Variation Affect Buying Power?" U.S. Department of Agriculture, Economic Research Service, Economic Information Bulletin, Number 75; Morrissey, Taryn W., Alison Jacknowitz, and Katie Vinopal. 2012. "Food Assistance and Children's Eating Patterns, Food Insecurity, and Overweight: The Influence of Local Food Prices." University of Wisconsin, Institute for Research on Poverty Discussion Paper, No 1409-13; Rose, Donald and Rickelle Richards. 2004. "Food Store Access and Household Fruit and Vegetable Use Among Participants in the US Food Stamp Program.' *Public Health Nutrition* 7(8): 1081-88.

[4] Allard, Scott W. 2013. "Placing Food Security in a Spatial Context." Paper presented at the Workshop on Research Gaps and Opportunities on the Causes and Consequences of Child Hunger, Committee on National Statistics, National Academy of Sciences Food and Nutrition Board, Institute of Medicine, April 8-9, 2013.

permit us to examine relationships between place, food shopping, and food security among particularly vulnerable populations (e.g., households without a car, individuals with physical limitations, the elderly, poor rural and suburban residents). Finally, in addition to large chain supermarkets, our analyses include a range of stores households frequent (e.g., small or non-chain grocery stores, specialty stores, convenience stores).

Apart from their scholarly value, our findings should be of interest to an array of policymakers, advocates, and program executives. Future development of interventions to enhance food security will benefit from clearer evidence on the roles of local retail food availability and pricing in determining food purchases and food security. Improved understanding of how spatial context shapes food insecurity could translate into more efficient and effective allocation of public program dollars, private capital, and philanthropic resources.

This report explores four key questions:

- Do poor and near-poor households have less spatial access to food retailers than households with higher incomes?
- How do food pricing and product availability vary across types of food retailers?
- How are spatial access to food retailers and spatial variation in food pricing associated with household decisions about shopping venues, food purchases, and food expenditures?
- When controlling for relevant household characteristics and food assistance receipt, what is the relationship between local food pricing, the availability of food retailers, and household food security?

We explore four hypotheses commonly found (or assumed to be true) in the literature

on food security, food shopping, and food assistance. These are:

- Supermarkets and supercenters have significantly lower prices on food items than other food retailers.
- Poor people and other vulnerable populations have less spatial access to food retailers, and particularly, lower-cost retailers, than more affluent or mobile populations.
- Where households shop, what they buy, and the degree of food security achieved are functions of spatial access to different types of retailers and local food prices, even when controlling for characteristics such as income, race and ethnicity, health limitations, and household composition.
- The availability of food assistance affects shopping patterns and the specific mix of foods bought.

Research Methods

A key contribution of this project to research on food access and food shopping is the calculation price indices from unique data linked within FoodAPS. We have calculated a set of food price indices based on shopping trips observed in FoodAPS.

FoodAPS Price Indices. To permit comparison of prices paid for food by different households and shoppers, we constructed a set of preliminary price indices based on the food purchases recorded in the FoodAPS data. First, to identify the specific items bought by food shoppers in the sample, we matched the product codes from 143,057 items purchased in nearly 16,000 shopping trips to product dictionary codes provided by ERS - a master product

dictionary and a second dictionary for perishables. Data on each observed purchase, including the price paid and the amount purchased, were then linked to data about the shopping trip in which the item was purchased. These shopping trip data include information on the location of the store where the trip took place and the total amount spent during the trip, along with information on the household and personal characteristics of the shopper making the trip. This produced an events-product file that consists of one record for each identified item bought in each shopping trip, along with information on the household, the shopping event, the item price, and the item price per unit. This event-product file includes records on 95,686 food items bought in 10,770 shopping trips by 3,975 households.

The 95,686 observed food item purchases were then collapsed into product categories using the descriptions in the master product file and the produce product file. Item descriptions vary considerably in the level of detail (e.g., “soup” – 1,194 purchases, vs. “ramen noodle soup mix”—732 purchases), requiring coding decisions about which products to group together. Using fairly generic terms, we produced a file of 910 total item categories.

The next step ranked each product by the amount spent on it relative to total expenditures across all of the observed purchases within a given type of trip. These rankings were created for six different trip types: all trips; focal trips (defined as the largest shopping trip observed during the week); all SNAP-participant shopping trips; all shopping trips by people in households eligible for but not receiving SNAP (SNAP-eligibles); SNAP-participant focal trips; and SNAP-eligible focal trips.

Within each shopping trip type, expenditures by a given household on each item were weighted to reflect that household’s sample weight:

$$E(X,Y)=P(X,Y)*N(X,Y)*hhw$$

where E(X,Y) is the total expenditure of a given household on item X, P(X,Y) is the average price paid per unit of X by the household in shopping trips of type Y, N(X,Y) is the number of units of the item bought in such trips, and hhw is the household weight. Total spending on a given item X in shopping trips of type Y was then summed across the weighted household expenditures (E(X,Y)) on that item for all trips of type Y. Finally, total spending for Y-type shopping trips by all relevant households was calculated by summing across the weighted expenditures for each item bought in Y-type trips, and the share of item X in trips of type Y was computed as E(X,Y) divided by total spending on type-Y trips. Products were then ranked in order of their expenditure share within each trip type.

Because many items were purchased too infrequently to produce useable price estimates, we focused on the most commonly bought items (across all trip types) in creating the market baskets we used to calibrate price levels across stores. Using these product rankings, we created price indices based on the top 25 food items. Price per lowest unit of consumption observable (e.g., ounce of milk, ounce of cereal, etc.) was calculated for each item. This gave us a price index based on a fixed market basket, weighted by the share of expenditures going to each of the included items over the sample as a whole. Since the index is calculated in dollars per smallest available unit averaged across all items in the basket, it ranges from about 60 cents to about $1.50 overall. The mean value of the index is about 70 cents across all stores.

This index was calculated for each store in the sample and used to compare prices across stores. FoodAPS only observes prices in stores where sample households purchased

products, however, meaning that many stores have no observed purchases for some items in the 25-item food basket. We solve for these missing prices by using the observed mean price of an item in the other stores within the primary sampling unit (PSU), the basic geographic stratification unit for the sample (generally a metropolitan area or a county or county group). For measures of product price levels in stores surrounding each respondent, we included stores for which we had prices for at least 5 items.[5]

Substitution of mean values for missing prices results in a downward bias in price variation, particularly given that about half the stores in which trips took place had observed purchases of fewer than 10 items. In addition, it is likely that the indexing process also biases the sample somewhat in favor of larger stores, since they are more likely to have a range of items that have been purchased in a reported shopping trip. To solve these problems, we are in the process of trying to match data from a much larger sample of food purchases to the stores observed in the FoodAPS sample, but this work has not yet been completed.

Using the FoodAPS sample data on purchases, we were able to construct indices for a total of 870 stores that were involved in 7,021 food shopping trips (65 percent of all food shopping trips). A second index, including only stores with at least 10 items represented, was also calculated. It included 489 stores. It is notable that although requiring a larger number of price observations reduces the number of stores very considerably, the number of shopping trips covered by those stores falls much less. This supports the hypothesis that larger stores with more price observations available account for a disproportionate share of all expenditures.

[5]We also tested an index that limited the sample of stores to those with at least 10 items represented, but substantially reduced the share of stores with a valid price indicator. Using the index based on at least 10 items, we could construct indices for only 489 stores and about 48 percent of all food shopping trips.

Some caution should be used when interpreting these preliminary indices. First, we only observe household purchases during the study observation week. The average household purchased 18 items in a given week and roughly three-quarters of households purchased 25 items or less. As a result, we do not have large numbers of price observations for similar food items available for many retailers in each PSU. Preliminary indices may not be fully comparable across stores, particularly in circumstances where there are few observations of specific food items included in the index at a given store. Our strategy to focus on the most frequent items purchased has attempted to address this issue and we are revising how we group food items observed in FoodAPS purchases.

Empirical Strategy. Descriptive analyses presented below compare food shopping outcomes, food retailer access, and food pricing across different population subgroups (e.g., race/ethnicity, poverty status, SNAP participation and eligible non-participants) and geographic locations (e.g., urban, suburban, or rural county). We also estimate a series of preliminary multivariate models across all FoodAPS households that explore factors associated with different household food shopping outcomes (*Y*) for households *h* in PSU *j:*

$$FoodOutcome_{h,j} = \beta X_{h,j} + \gamma Access_{h,j} + \varepsilon_{h,j}$$

Food shopping outcomes include: total food store expenditures; percent of food expenditures at supermarkets, superstores, and grocery stores; whether the focal trip was at a grocery or supermarket; and household food insecurity. *X* represents household demographic, economic, and census tract characteristics. *Access* captures food retail access measures that reflect proximity to different store types. Because of limitations in food price indices calculated from FoodAPS purchase data discussed below, our multivariate models do not include food price

index measures at this time.

Data

This study uses data from the FoodAPS survey. When survey weights are applied, FoodAPS is a nationally representative survey of American households conducted by the USDA that collected unique and comprehensive information about household food purchases, household demographic and employment characteristics, food assistance receipt, and the contours of local food resource infrastructures from April 2012 to January 2013. FoodAPS includes nationally representative data from 4,826 households, including oversamples of those participating in SNAP and low-income households not participating in SNAP.[6] In this report, we are particularly interested in FoodAPS data about foods purchased for consumption in the home across the entire sample and a sample of households eligible for SNAP.

FoodAPS data are based on two in-person surveys conducted with households at the start and end of a seven-day period, complemented by data drawn from three telephone interviews and household tracking of food purchases during that seven-day period. Information about race, ethnicity, gender, age, marital status, work status, and health are gathered for all individuals in the household. For each household, FoodAPS has information about food purchase or shopping "events" during the week of observation, including store type, products purchased, and pricing. Household measures of program participation, food security, and income are also gathered. Along with FoodAPS measures of household demographics,

[6] The FoodAPS sample is drawn from an address-based survey with a sample frame based on the 2010 U.S. Census. The sample is stratified by geographic area and by income category, with an over-sample of low-income households, and is weighted to reflect the total non-institutionalized population of the United States.

employment, earnings, and program participation, we draw upon restricted-use data to calculate household food shopping measures, including the type of retail food store most frequented, total weekly food expenditures, percent of weekly food purchases at supermarkets, and price indices of common food products purchased.

Respondent and Household Characteristics. FoodAPS collects information from a primary respondent in each household. In this paper, we draw upon self-reported information about the primary respondent's race, age, marital status, completed education, health status, body mass index (BMI), and car ownership. Information about the other non-guest members of the household is compiled to reflect household-level measures of household size, number of children under 18 years old, household composition (e.g., nuclear family only, presence of extended family, presence of friends). It is the case, however, that information about household food purchases during the study week is gathered from both the primary respondent and other persons in the household. Other household members either provide information to the primary respondent about food purchases or document purchases using food purchase booklets distributed to surveyed households.

FoodAPS draws upon information about all household members to create monthly income measures. The ratio of household income to the federal poverty threshold is also calculated.[7] Respondents also provide information about difficulty making ends meet or difficulty paying bills in the last six months, which we use to construct a measure of financial

[7] The poverty thresholds used vary by household size and composition, with adjustments for the total number of persons in the unit, the number of persons over age 65 (for smaller units) and the number of children under age 18. The weighted average poverty threshold for a three-person unit (approximately the average household size in the U.S.) was $18,552 in 2013.

hardship. Finally, the county location of each respondent was coded as urban (metropolitan area containing primary city), suburban (within metropolitan area, does not contain the metro area's primary city), or rural (non-metropolitan area) following Office of Management and Budget definitions of metropolitan and non-metropolitan areas.[8]

Household Food Security and Food Assistance. Each respondent also completed the 10-item USDA 30-day Adult Food Security Scale. In addition to a four-category measure of food security (high, marginal, low, or very low food security), we create a dichotomous measure to indicate whether a household was food secure or food insecure (low or very low food security) in the 30 days prior to the interview. Our measure of SNAP participation is drawn from a combination of respondent self-report about household SNAP receipt at the time of the interview and administrative data records.[9] In addition to information on whether households were receiving SNAP benefits at the time of the survey, FoodAPS collects information about the benefit received in that most recent month.[10] To identify households that are eligible but may not be receiving SNAP, we draw on a FoodAPS measure that estimates which respondent

[8] Allard, Scott W. 2014. "Places in Need: The Changing Geography of Poverty and the American Safety Net." Paper presented at the Poverty and Place Conference, Center for Poverty Research at UC-Davis, November 13, 2014.
[9] Self-reports were verified with administrative data and corrected if self-reports were not confirmed. Self-reported SNAP receipt was used for 122 cases that did not consent to the administrative data match.
[10] Household monthly SNAP benefit amount is derived from several variables. For most households, it is based on the self-reported benefit amount for the last month the household received assistance. For households receiving SNAP, but not reporting a benefit amount, we take the average of benefit amounts received reported in administrative data matched to FoodAPS households. There are several reasons we prefer self-reports when possible to administrative data. First, administrative data were linked to households using probabilistic matching, which varied procedurally from state to state. Second, because program data available varied from state to state, many respondents receiving SNAP did not have reported benefits in administrative data. Nevertheless, we believe that administrative data are useful when no other information about benefits is available. Finally, households receiving SNAP with a self-report or administrative data monthly benefit amount less than $16 are set to the minimum monthly benefit level of $16. See, Aussenberg, Randy Alison. 2014. "Supplemental Nutrition Assistance Program (SNAP): A Primer on Eligibility and Benefits." Congressional Research Service Report 7-5700, https://www.fas.org/sgp/crs/misc/R42505.pdf.

households were SNAP-eligible.[11] Finally, FoodAPS collects self-reported information about current receipt of food assistance from food pantries and other emergency food programs, as well as receipt of food products from the USDA commodity food program.

Food Shopping Venue. FoodAPS respondents provide information about the store, type of store, and store location where food shopping typically occurs. We refer to this as the "primary" food shopping venue. Drawing on data collected during the study week, we also count the number of stores visited and note the store type. The shopping trip where the largest total expenditure occurred during the study week is labeled the household "focal shopping event" and the store is categorized as the household's "focal food retailer."[12]

Food Retailer Access. Preliminary analyses use three sets of food retailer access measures created by FoodAPS. One set of measures reflects the one-way distance to the nearest SNAP-authorized retailer by type of retail outlet (e.g., supermarket, convenience store). Specifically, we focus on distance to the nearest SNAP-authorized supermarket and to the nearest SNAP-authorized convenience store. A second set of measures focuses on one-way distance and driving times to food retailers. Here we focus on distance and time to all food retailers, as well as the distance and time to the focal shopping event. A third set of measures tallies the number of SNAP supermarkets within 1, 5 and 10 miles using a straight-line Euclidean

[11] FoodAPS assessment of household SNAP eligibility was based on household and individual-level data on household composition, income, assets, and on state program eligibility rules (using the MATH SIPP+ model). FoodAPS contains four variables that estimate SNAP eligibility using different assumptions about reported household income and the possibility of multiple eligible units within the household. In this paper we use the "run 4" measure that allows for there to be multiple eligible units in the household and multiplied reported net income by 1.4 to approximate gross earnings.

[12] The average monthly SNAP benefit among program participants in FoodAPS was $253.68, thus shopping events totaling more than $250 were excluded from focal shopping event calculations to reduce the impact of outliers on expenditure calculations. Excluding trips in this manner lowered the total number of food store shopping events from 14,943 to 14,716.

distance calculation between the respondent's home and a given food retailer.[13]

Food Expenditures. We calculate several measures of household food expenditure based on data collected by FoodAPS. First, we sum total expenditures after coupons and taxes for food items purchased outside the home for consumption inside the home during the study week.[14] Second, we calculate the total expenditures at grocery stores, supermarkets, or super store during the study week that includes food and non-food items. Finally, we determine the total expenditures for food and non-food items from the focal shopping event.[15]

Results

Table 1 reflects survey-weighted basic characteristics of the overall FoodAPS sample and of two subpopulations of interest: households with income below poverty and households that are SNAP-eligible (includes both SNAP recipients and non-recipients).[16] As expected, the low-income and SNAP-eligible samples differ from the overall sample. For example, consistent with the higher prevalence of poverty among race and ethnic minorities, the low-income sub-population has a higher proportion of black and Hispanic respondents than the overall sample. Low-income households and those eligible for SNAP also are more likely to have less completed education, to have experienced unemployment in the prior week, and to have more financial

[13] We exclude shopping trips that were over 40 miles in distance or 60 minutes in driving time oneway. Excluding distance outliers in this manner removes 202 shopping trips. Excluding driving time outliers in this manner removes 158 shopping trips.
[14] FoodAPS also contains measures of total expenditures at food stores, which include food and non-food purchases. Our food expenditure calculations are based on food items purchased. A negative expenditure total was reported for 34 of 132,154 purchased food items, we set these to $0.
[15] For all measures of total expenditures at grocery stores, supermarkets, and superstores, we exclude shopping events totaling more than $250. Similarly, focal shopping trips exclude shopping events totaling more than $250.
[16] We omit one household from the FoodAPS sample because the respondent indicated they were a guest in the household, thus our sample size of 4,285 is one less than the total sample of FoodAPS (4,286).

hardship.

(Table 1 about here)

Food Assistance and Food Insecurity. Our first set of descriptive analyses examines a number of different household food outcomes across the entire FoodAPS sample, households in poverty, and households eligible for SNAP by whether they participated in the program or not. The top panel in Table 2 reports the prevalence of food assistance receipt among households. We find that 39.5 percent of poor households did not receive SNAP benefits at the time of the survey, which suggests that there may be many households that are eligible for but not participating in SNAP. Similarly, although not shown directly in Table 2, we find that 40.3 percent of households determined to be SNAP-eligible by FoodAPS are receiving SNAP benefits at the time of the study week.

Table 2 also shows that much smaller shares of low-income households – less than 15 percent – report receiving help from food pantry programs, USDA food programs, meals at facilities, or delivered meals. Indicative of material hardship differences between SNAP participants and eligible non-participants, however, we find SNAP households are much more likely to receive food pantry and emergency USDA commodity assistance than eligible households that do not receive SNAP. Fourteen percent of SNAP eligible who participated in the program reported food pantry assistance in the past 30 days, compared to less than 4 percent of eligible non-participants.

(Table 2 about here)

The next two panels in Table 2 report the prevalence of food insecurity. Comparable to figures from the Current Population Survey in 2013, we find that nearly one-half of poor

households are food insecure (49.0 percent), compared to 15.9 percent of the entire FoodAPS sample.[17] SNAP participants were more than twice as likely to qualify as food insecure compared to eligible non-participants (45.2 percent versus 22.4 percent, respectively). Such findings are consistent with the notion that SNAP-eligible households participating in the program may be in greater need than eligible non-participants.[18] Participation in SNAP is correlated with high levels of food insecurity, in other words, not because the program makes households worse off, but rather because those income-eligible households in greatest need are most likely to enroll in the program. The four-category food security measure provides a similar story. SNAP participants are much less likely to report high food security status (33.0 percent) than the sample overall (69.2 percent) or eligible non-participants (59.9 percent). Also, SNAP participants are much more likely to report very low food security status (20.0 percent) than the sample overall (6.5 percent) or eligible non-participants (10.1 percent).

Household Food Shopping. Next, we report frequencies for the store type primarily used for grocery or food shopping. Consistent with research elsewhere, we find that well over 90 percent of poor and non-poor households report using supermarkets or superstores as their primary food shopping venue.[19] Less than 3 percent of poor households or SNAP-eligible

[17] Coleman-Jensen, Alisha, Christian Gregory, and Anita Singh. 2014. "Household Food Security in the United States in 2013." USDA, Economic Research Service, Economic Research Report No. (ERR-173) 41 pp, September 2014.
[18] Nord, Mark and Marie Golla. 2009. "Does SNAP Decrease Food Insecurity? Untangling the Self-Selection Effect." USDA, Economic Research Service, Economic Research Report No. (ERR-85), October 2009; Bitler, Marianne P. 2016. "The Health and Nutrition Effects of SNAP," in *SNAP Matters*, eds. Judith Bartfeld, Craig Gunderson, Timothy M. Smeeding, and James P. Ziliak. Stanford University Press.
[19] Mabli, James. 2014. "SNAP Participation, Food Security, and Geographic Access to Food." Prepared by Mathematica Policy Research for the U.S. Department of Agriculture, Food and Nutrition Service; Ohls, James C.; Ponza, Michael; Moreno, Lorenzo; Zambrowski, Amy; Cohen, Rhoda. 1999. "Food Stamp Participants' Access to Food Retailers: Final Report." Submitted to USDA Food and Nutrition Service, Office of Analysis and Evaluation, by Mathematica Policy Research, Inc.; U.S. Department of Agriculture. 2009. "Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and their Consequences. Report to Congress." Administrative Publication No (AP-036).

households report convenience stores, dollar stores, or some other type of retailer (e.g., specialty shop, farmers market) as their primary food shopping venue.

The bottom half of Table 2 examines shopping trips completed during the study week. We see that households tend to make about 3.5 food shopping trips per week, with about two-thirds of all trips going to supermarkets or superstores. There are no statistically significant differences in the frequency of shopping trips across income or SNAP eligibility status. The mean food store shopping trip expenditure is about $30 for poor and SNAP-eligible households alike.

As we might expect from shopping trip figures, the vast majority of household food shopping expenditures occur at food stores. For example, the average household spent $109.91 on food shopping trips during the study week, of which $103.80 came at food stores. Similar patterns are present for low-income households and SNAP recipients. Poor households, SNAP participants, and SNAP-eligible non-participants spend about $10 to $30 less on food shopping trips total than the average household in the sample. Interestingly, when totaling only expenditures explicitly on food items – non-food items are purchased on food shopping trips – we find the differences between poor households and the full sample falls to about $16 ($70.43 versus $86.10, respectively). SNAP participants spent about $10 more on food items during the study week than eligible non-participants ($83.32 versus $72.10, respectively).

Perhaps surprising given the focus on proximity to food retailers and the common expectation in the policy research community that households will shop near their homes, the

average FoodAPS household travels 4.1 miles one-way on food store shopping trips. SNAP participants' average travel distance for food store shopping trips is about the same as the average for eligible non-participants (3.6 miles versus 3.9 miles). The typical FoodAPS respondent, whether poor or non-poor, SNAP participant or eligible non-participant, averages about a 9 to 10 minute drive from the food shopping venues used.

Such findings may reflect a number of realities. First, households may combine food shopping with trips to work, school, or daycare that take them far from their place of residence. Second, food shopping trips for those without automobile access may be timed when family members or friends are shopping, which again may mean households are shopping away from stores in their immediate vicinity. Third, it may be that households are shopping at stores where prices or quality are more preferred to local stores. Future analyses will attempt to tease out whether there is evidence of these different possible explanations for such lengthy travel distances.

To narrow our focus among the many shopping trips that occurred during the study week, the bottom panel of Table 2 examines the focal shopping event, or the largest shopping trip in terms of total expenditures at a food store. As we see the mean expenditure of the focal shopping trip is almost twice as large as that for the average food shopping trip. For example, the average FoodAPS household spent $65.53 during the focal shopping trip, compared to an average of $36.96 for all food shopping trips. Focal shopping trips averaged 18.5 items. Suggestive that big shopping trips occur in different places than smaller trips during the week, we find the mean one-way distance to the focal shopping venue was roughly 50 percent longer than that of the mean distance to all food shopping venues - about 6 miles for all FoodAPS

respondents- although the drive times to focal shopping venues was only 1-2 minutes higher on average.

Table 3 provides a breakdown of key food shopping outcomes (number of trips, total expenditures, and mean distance traveled) by a set of household characteristics to examine how shopping may vary across different population sub-groups. The top panel of Table 3 examines race and ethnic differences in food shopping outcomes. We find significant differences in household shopping trips and expenditures across race and ethnic groups. For example, Asian respondents reported about 0.6 more shopping trips than black respondents during the study week. Whites, blacks, and Hispanics, however, report roughly the same number of shopping trips during the week. Total food store expenditures during the study week did not differ significantly across white, Hispanic, or Asian respondents. Black respondents, however, spent about 60 percent as much at food stores in the study week as white, Hispanic, or Asian respondents. The average black household reported $73.54 in total food store expenditures, compared to $117.00 for the average white household. Similar patterns were present for the total spent during the focal shopping trip – black respondents spent about $25 less than white respondents. Smaller, but significant differences in the size of the focal shopping trip also exist between black, Hispanic, and Asian respondents. Such findings, however, do not control for household size.

About 90 percent of all household food store expenditures during the study week occurred at grocery stores or supermarkets, although there are modest differences across race and ethnic groups. The focal shopping trip represented about two-thirds of weekly food store expenditures for white and black households, compared to about 61 percent of weekly food

expenditures among Hispanic and Asian households. Distance and driving times to the focal shopping event varied between whites and non-whites, with white respondents traveling farther and having longer driving times than respondents of other race and ethnic groups. Combined, these findings from the top panel of Table 3 reflect the greater prevalence of income poverty among black Americans, but also the greater geographic mobility of white Americans in metropolitan and non-metropolitan areas.

(Table 3 about here)

A few other findings stand out as we examine food shopping outcomes across household size, SNAP eligibility, and geography. Not surprisingly, we see that food shopping varies quite a bit by household size, with larger households making more frequent trips and spending more. We note a statistically significant difference in the shopping behaviors of SNAP-eligible households who receive benefits and those who are eligible but not participating in the program. For example, the average SNAP participant makes more trips than the average eligible non-participant (3.8 versus 3.2, respectively). There is no statistically significant difference, however, in total expenditures between SNAP participants and eligible non-participants. Consistent with limits on purchases permitted by SNAP, we see SNAP households spending about $11 more on food items than eligible non-participants ($83.32 versus $72.10, respectively). Such descriptive results also may reflect the impact of additional purchasing power provided by SNAP.

Other interesting patterns emerge in the bottom of Table 3. We observe differences in shopping outcomes across households with income at or below 200 percent of poverty by self-reports of access to a car. For example, respondents at or below 200 percent of poverty with

access to a car spend about 20 percent more than those without a car ($88.29 versus $72.24, respectively), and those with cars travel nearly twice as far to the focal store (6.5 versus 3.9 miles respectively). Perhaps reflecting differences in pricing, we see that urban and suburban households spent about 20 to 25 percent more each week on food than rural households. Rural households also travel about twice as far to complete their focal shopping trip as households in urban or suburban counties (9.3 miles one-way versus 4.0 and 5.5 miles, respectively).

Food Store Access. Table 4 examines average levels of access to SNAP supermarkets and convenience stores as reflected by straight-line distance to the nearest store and by the number of SNAP supermarkets within different radii. Consistent with more recent work on access to food retailers, we find that black and Hispanic households are much closer to the nearest SNAP supermarket or superstore than white households and they are located within 1, 5, and 10 miles of many more SNAP supermarkets and superstores than white households. For example, black and Hispanic households are within 1 mile of about 0.5 more supermarkets and superstores than white households. On average, black and Hispanic households are within 5 miles of 13.0 and 22.6 SNAP-authorized supermarkets and superstores respectively, compared to 7.7 supermarkets and superstores for the average white household.

(Table 4 about here)

Consistent with our findings that there are few statistically significant differences in food shopping outcomes among SNAP participants and eligible non-participants, the second panel of Table 4 suggests there are only modest differences in food retailer access, and that these differences approach but do not reach conventional levels of statistical significance. SNAP participants are 2.6 miles to the nearest SNAP supermarket or superstore compared to 3.1

miles for eligible non-participants. Both participants and non-participants are within five miles of about a dozen SNAP-authorized supermarkets and superstores.

The bottom panels of Table 4 examine food retailer access across geography by income categories. First, we find that urban households are closer to SNAP retailers than households in suburban and rural areas. The average urban household is 1.5 miles from a SNAP-authorized supermarket or superstore, more than 1 mile closer than the average suburban household (2.8 miles) and five miles closer that the average rural household (6.6 miles). Urban residents also, as we might expect given population and retail densities, are within 1 mile, 5, and 10 miles of many more SNAP supermarkets and superstores on average than rural residents.

Urban-suburban-rural differences persist when comparing income groups across geography. For instance, poor urban households on average are about 1.2 miles from the nearest SNAP-authorized supermarket or superstore, compared to 2.7 miles for poor suburban households and 5.0 miles for poor rural households. The second column in Table 4 also shows that urban residents are closer to SNAP-authorized convenience stores than suburban or rural residents. Similarly, we find consistent evidence that urban poor and near-poor households have access to at least as many, if not a larger number of, SNAP supermarkets within 1, 5, and 10 miles of their place of residence than comparable population sub-groups in suburban and rural areas. Poor urban households are within 1 mile of 1.4 SNAP supermarkets and superstores on average, compared to 0.5 SNAP supermarkets and superstores for the average poor rural household.

Finally, when comparing comparable income sub-groups within urban, suburban, and rural geographies, we find that poor households are at least as close to SNAP-authorized

supermarkets on average, if not closer, than non-poor households. For example, poor urban households are 0.4 of a mile closer on average to the nearest SNAP supermarket than urban households with income over 200 percent of the federal poverty guidelines (1.2 miles versus 1.6 miles, respectively). Rural poor households are 2 miles closer to the nearest SNAP supermarket than households near the poverty line (5.0 miles versus 7.0 miles, respectively). Poor urban households are within 5 miles of 3 more SNAP-authorized supermarkets and superstores than urban households with income above 200 percent of the poverty line (18.6 versus 15.5, respectively). Smaller, but statistically significant, differences in the number of SNAP-authorized supermarkets within 1, 5, and 10 mile distance bands are found when comparing poor and near-poor suburban households, as well as when comparing poor and near-poor rural households.

Food Items Bought and Prices Paid. FoodAPS data allow insight into the specific goods bought and prices paid across different types of shoppers and types of shopping trips. Tables 5 through 8 show our preliminary results on expenditures and prices based on the FoodAPS data. Of particular interest for this paper are comparisons between SNAP participants, households who are eligible but not participating in SNAP, and households not eligible for SNAP. Below we find evidence that these different types of households purchase somewhat different mixes of goods. Additionally, some items, such as milk, soda and infant formula, make up a larger share of expenditures on non-focal trips than on focal trips—presumably these are the types of goods that shoppers will either buy as part of a small, local purchase when they run out, or will pick up casually while shopping for non-food items.

To start, Table 5 ranks food products by their share of total food expenditures during

the study week, based on the FoodAPS data. To qualify for this ranking, items must have been purchased at least 50 times by respondents. We present the rankings for the top 12 items as a percentage of total expenditures all shoppers and all trips, then rank the same items across other types of shoppers and trips. Soda ranks first or second in all trips across the entire group of shopping trips. Overall, the lists are similar across all types of shoppers, regardless of food assistance receipt or eligibility.

(Table 5 about here)

A given food item's share of total food spending across shopping trips depends both on the price of an item and how often it is bought, as indicated in the discussion of product rankings by expenditure share above. Certain items, such as infant formula, are bought relatively infrequently, but have relatively high costs per unit (e.g., ounce) compared to soda or milk. As a result, even infrequent purchases of high-priced goods such as formula will consume a relatively large share of total expenditures. This is illustrated in Table 5, which shows both the number of times each food item was purchased and its share of total food expenditures across all shopping trips recorded in the FoodAPS data. Even though infant formula ranks 180th in frequency of purchase—that is, the number of times an item shows up in a recorded shopping trip (not shown in Table 5)—but is 11th overall as a share of total expenditures because it is relatively expensive.[20]

In Table 6, we show the mean share of total expenditures in a given FoodAPS shopping

[20] Formula is bought so infrequently in focal shopping trips that it did not crack the top 12 in number of purchases, but its high price means that it does enter the top 12 in terms of percentage of food expenditures. It has therefore been included in the preliminary price indices shown below, which as noted above have been weighted to reflect relative shares of spending for each product.

trip that went to each of the items included in Table 5. As can be seen, no single item accounted for a very large share of expenditures for any single group—indeed, the top 12 items as a whole accounted for just less than 30 percent of total expenditures. Soda and milk are the only items to account for over 4 percent, and even they only did so for non-focal trips. While soda is roughly 4 percent of all food expenditures in a week, the next 11 items compose about one-quarter of all food expenditures.

Even though soda is the top product in frequency and percentage of expenditures, it is a very small part of the entire food basket families purchased in a week. Focal trips had higher expenditure shares for meat of all types, including chicken, lunchmeats, and beef. SNAP recipients spent a slightly higher share of their budgets on meat than did similar non-participants, possibly because they were a bit less budget-constrained.

(Table 6 about here)

Table 7 presents price indices for 11 top products by expenditure share over the sample of 870 stores and approximately 7,000 shopping trips in the FoodAPS data. Table 8 shows the relative prices paid for goods bought on focal and non-focal trips, and for SNAP participants and eligible non-participants.[21] The mean price paid for a specific product across all shopping trips and shoppers has been normalized to 1.0, in order to make it easier to compare price levels across types of shoppers. Thus, for example, the value for all focal shopping trips, 0.99, indicates that mean prices paid in focal trips for the goods included in the index were about 99 percent of the prices paid across all trips.

[21] Only 11 of the 12 reference items are shown, because too few shopping trips included infant formula for the data on variations in its price to be reliably calculated.

With these price indices, we find limited evidence of significant differences in average prices paid by shoppers of different types. SNAP participants paid slightly lower prices than average FoodAPS shoppers, about 97 percent as much overall, and about 95 percent in focal shopping trips. As the standard deviations shown across the bottom of the table imply, these are for the most part not statistically significant differences, although it does appear that SNAP participants may pay slightly less on average than other shoppers.

(Table 7 about here)

Table 8 shows variations in prices across types of place—urban, suburban, and rural. While there are small variations, they again appear not to be statistically significant. It should be noted that the index used is somewhat crude, and in particular, we have not been able to adjust for any possible quality differences. For example, if SNAP shoppers buy generic or store brand goods more than other shoppers, this may account for any price differences seen.

(Table 8 about here)

Some caution should be used when interpreting food price indices calculated from FoodAPS self-reported purchases. First, we only observe household purchases during the study observation week. The average household purchased 18 items in a given week and roughly three-quarters of households purchased 25 items or less. As a result, the data do not contain a large number of price observations for similar food items purchased from many different retailers in each PSU. Therefore, our preliminary indices may not be fully comparable across stores, particularly in circumstances where there are few observations of specific food items included in the index at a given store. Further, because the methodology we used addressed the problem of missing observations by substituting the mean price for a specific item across all stores within the same locality into the store index when there were no observed purchases of that item within a store, the variance in prices across stores will tend to be

understated. This will be most pronounced in stores with larger numbers of missing market basket items. Because the index is constructed to average 1.0 across all stores, this methodology will result in store price indices that are closer to 1 than would likely be the case if more price observations were available.

Results from a series of preliminary multivariate models are presented in Table 9. The bottom of Table 9 reflect the coefficients for each access measure from models where a given access measure was included separately but the with other covariates listed at the top of Table 9. The inclusion of any given access measure did not affect the coefficient for demographic, economic, or program participation measures, so we report findings from the main model that used distance to the nearest SNAP supermarket as the access measure.

(Table 9 about here)

Total food store expenditures. As expected, there is a positive relationship between the number of people in a household and total food store expenditures. Also consistent with our descriptive results, we find that black and Hispanic households spend about $30 less at food stores in a week than white households even when controlling for other household characteristics (e.g., household size) and spatial context. We find that SNAP eligible non-participants spend about $8 less per week on food shopping than non-eligible households when controlling for other household characteristics.

Percent of expenditures at food stores. Very few household characteristics are associated with the percentage of food expenditure at food stores. We believe this reflects the fact that most food shopping occurs in food stores and there are only modest differences in share of purchases at food stores during the study week between different population sub-groups. Automobile access is associated with a higher percentages of food expenditure at food

stores, although the cross-sectional nature of these data make it hard to rule out the endogeneity of car ownership to food shopping decisions or venues.

Focal trip at a grocery or supermarket. Again, the vast majority of focal food shopping trips – the largest observed shopping trip in a week – are at grocery stores or supermarkets. It is not surprising, therefore, that relatively few household characteristics are associated with such decisions. We find some evidence that respondents identifying as Asian are more likely than whites to take their focal trip at a grocery store or supermarket. The likelihood of focal trips occurring at a grocery store or supermarket appears to increase slightly with the age of the respondent. As found when looking at percent of expenditures occurring in food stores, automobile access is associated with a higher likelihood of focal shopping trips occurring at a grocery or supermarket.

Food insecurity. We find a set of respondent or household characteristics associated with food insecurity similar to that reported in the larger literature of food insecurity.[22] Hispanic and multi-race households also are more likely to experience food insecurity than white households. Lower levels of completed education are positively related to food insecurity. Although fair or poor health is not associated food expenditures, those with self-reported fair or poor health are much more likely to experience food insecurity than those with

[22] See Cathy Campbell and Ellen Desjardins. 1989. "A model and research approach for studying the management of limited food resources by low income families." *Journal of Nutrition Education,* 21 (4): 162-70.
Alisha Coleman-Jensen, Matthew P. Rabbit, Christian A. Gregory, and Anita Singh. 2016. "Household Food Security in the United States in 2015." U.S. Department of Agriculture, Economic Research Service, ERR-155; Craig Gundersen, Brent Kreider, and John Pepper. 2011. "The Economics of Food Insecurity in the United States." *Applied Economic Perspectives and Policy*, 33 (3): 281–303; Mark Nord, Alisha Coleman-Jensen, Margaret Andrews, and Steven Carlson. 2010. "Household Food Security in the United States, 2009." USDA, Economic Research Service, Economic Research Report No. 108.

good or better self-reported health. Consistent with evidence that SNAP participants have greater need than eligible non-participants and of self-selection into SNAP, we find SNAP households to be much more likely to experience food insecurity than non-eligible households. We do not interpret these findings as indication that SNAP participation reduces household food security.

Relationship between household food outcomes and food retailer access. The bottom panel of Table 9 contains coefficients for a set of food resource access measures. To simplify presentation, results reflect coefficient estimates and standard errors when a given measure is included in a model by itself, along with the set of demographic and economic factors reported above. Most measures of spatial access to SNAP-authorized food stores are not significantly associated with household food outcomes in Table 9. We interpret these findings to reflect the reality that access to food retailers alone is not likely to be an important driver of food behavior.[23] Nevertheless, a few findings stand out. Concentrations of supermarkets within 1 or 2 miles of a respondent appear positively associated with weekly food expenditures. We also find a small, but significant, negative relationship between access to convenience stores and household food insecurity. Such results suggest there is room for researchers to continue to examine the relationship between spatial context and household food outcomes.

Discussion

A few key findings stand out from this preliminary report. First, descriptive analyses

[23] See also Allard, Scott W., Maria V. Wathen, H. Luke Shaefer, and Sandra K. Danziger. Forthcoming. "Neighborhood Food Infrastructure and Food Security in Metropolitan Detroit." *The Journal of Consumer Affairs*.

indicate that many population sub-groups identified in the literature as being vulnerable to low food resource access, such as blacks or urban residents, have greater or comparable spatial access to several different types of food resources compared to less vulnerable population sub-groups. We also do not find much support for most conventional food desert hypotheses about access to food retailers among the poor and near poor. In fact, focusing on access to food retailers only in urban areas looks past the much larger gaps in access to food retailers that are found in suburban and rural areas. Second, although preliminary, we find some evidence of differences in shopping behavior among households receiving SNAP and those households eligible, not receiving SNAP. Additional work will investigate these initial findings and explore whether they extend to specific food purchases and prices paid. Finally, we do not see significant differences in foods purchased or prices paid across SNAP recipients and eligible non-participants, although we again encourage caution when interpreting food pricing information from FoodAPS.

Conclusion

These results are preliminary and additional analyses are in progress. In future work, restricted use information about the spatial location of respondents and food retailers will be used to calculate textured distance- and store-price-weighted measures of food resource access for each respondent. We will calculate the presence of retail food stores with cheaper or more expensive price indices across different distance bands of each respondent (e.g., 1, 5, and 10 miles). Another set of access measures will combine distance with store-level information about sales of fruits and vegetables, to capture stores most likely to sell healthy food options.

Perhaps most importantly, we will use IRI Scanner Data to advance our analyses of price data to better discern whether different population sub-groups pay more or less for the same products than other sub-groups. To give us a larger sample of price observations and to include a larger sample of stores at which FoodAPS participants could have shopped, we have also calculated price indices for stores within specific distance bands for each FoodAPS household using IRI price data and price data available through FoodAPS. These data include information taken from checkout data on a much larger sample of food sales in stores in the same geographic areas as the stores included in the FoodAPS data. These shopping trip data are collected through the use of a large panel of consumer households who scan their purchases by shopping trip, allowing some information on the characteristics of consumers to be matched to the price and consumption data. IRI/Nielsen data includes information on more than 43,000 stores located in the same metropolitan areas or nonmetropolitan regions as the 870 stores used to produce the FoodAPS-based price indices discussed above. There is geographic information on the locations of the stores included in the IRI data, as well as store identifiers, and using this information it is potentially possible to match stores from the two data sets, providing a larger selection of items to include in our indices. Particular attention in this work will be paid to prices paid for healthy and fresh food items, such as fruits and vegetables. Another component of this price analysis will be to discern price differences between the focal shopping venue and food retailers that are located nearer or more distant.

Table 1: Sample Descriptives, National Household Food Acquisition and Purchase Survey (FoodAPS).

	Percentage of Households		
Respondent Characteristics	All	Income <=100% of FPL	SNAP Eligible
Race			
Black	12.4 (1.7)	26.8 (4.7)	18.9 (2.8)
White	68.4 (2.5)	42.1 (4.1)	55.3 (3.4)
Hispanic	12.7 (2.4)	24.8 (5.8)	19.9 (3.7)
Asian	3.6 (0.7)	2.0 (0.8)	2.5 (0.8)
Marital Status			
Married	44.2 (1.5)	19.7 (1.6)	28.5 (1.6)
Not Married	33.5 (1.5)	47.0 (2.8)	43.9 (2.0)
Never Married	22.3 (1.3)	33.3 (2.8)	27.6 (1.9)
Mean Household Size	2.4 (0.04)	2.4 (0.1)	2.5 (0.1)
Age			
18 to 24 Years Old	6.0 (0.6)	9.1 (1.8)	7.7 (0.8)
25 to 34 Years Old	16.0 (0.9)	16.1 (1.5)	15.0 (0.9)
35 to 44 Years Old	16.5 (1.1)	18.1 (1.9)	15.0 (1.0)
45 to 54 Years Old	18.8 (1.0)	19.1 (1.7)	17.5 (1.3)
55 to 64 Years Old	20.4 (0.9)	18.1 (2.1)	19.4 (1.5)
65 Years or Older	22.2 (1.2)	19.6 (4.1)	25.4 (2.2)
Education Completed			
Less than HS Degree	9.7 (1.1)	31.6 (3.1)	19.7 (1.9)
HS Degree, No BA	24.8 (1.4)	29.4 (2.7)	32.6 (1.5)
Some College/Assoc Deg	33.2 (1.6)	28.8 (1.6)	29.4 (1.6)
BA or Higher	32.3 (2.0)	10.2 (1.4)	18.2 (2.0)
Work Status			
Worked in Prior Week	55.6 (1.1)	23.2 (2.2)	36.2 (2.0)
Unemployed in Prior Week	5.4 (0.4)	15.4 (1.8)	10.7 (0.7)
Fair/Poor Health Status	18.3 (1.1)	37.4 (4.1)	27.8 (2.0)
Mean BMI	28.0 (0.2)	29.4 (0.4)	28.6 (0.2)

Respondent Characteristics	Percentage of Households All	Income <=100% of FPL	SNAP Eligible
Household Income as % of FPL			
HH <=100% of FPL	12.2 (1.0)	100.0	35.0 (2.1)
HH <=185% of FPL	28.8 (1.6)	0.0	70.8 (2.0)
HH <=200% of FPL	31.5 (1.7)	0.0	73.5 (2.0)
HH <=250% of FPL	41.0 (1.7)	0.0	79.0 (1.7)
Mean Monthly Household Income	5234.73 (221.59)	840.76 (21.38)	2599.90 (136.02)
Have a Car	89.2 (1.2)	60.5 (2.5)	75.9 (2.2)
Households Reporting Difficulty Making Ends Meet at Least Occasionally	41.7 (1.8)	76.0 (1.5)	59.7 (1.6)
Utilities Not Paid in Last 6 Mos	23.2 (1.3)	36.8 (2.8)	30.5 (1.6)
Problems Paying Bills in Last 6 Mos	29.2 (1.9)	44.1 (3.5)	35.8 (1.9)
Payday Loan in Last 6 Mos	7.4 (0.7)	8.5 (1.4)	7.7 (1.1)
Geography			
Urban County	41.1 (7.6)	49.4 (7.6)	45.1 (7.9)
Suburban County	35.2 (6.5)	22.1 (5.2)	30.5 (6.5)
Rural County	23.8 (3.8)	28.5 (4.9)	24.4 (4.2)
Unweighted N	4,825	1,197	2,649

Note: Column percentages reported unless otherwise noted. Survey weights applied. Estimated SNAP eligibility measures allow for multiple SNAP units in household and are based on gross earnings. Geographic location was rounded to the nearest five or ten percentage point level to protect against potential disclosure of respondent location.

Source: National Household Food Acquisition and Purchase Survey (FoodAPS)

Table 2: Food Assistance and Food Shopping Outcomes in FoodAPS.

	Percentage of Households			
	All	Income <=100% of FPL	SNAP Eligible, Participate	SNAP Eligible, No Participation
Food Assistance, Percent Receiving				
SNAP (snapnowhh)	13.6 (1.0)	60.5 (3.0)	100.0	0.0
SNAP Amount Last Month ($)	251.04 (7.87)	266.06 (9.48)	253.20 (8.01)	na
Food Pantry Assistance	3.3 (0.3)	13.8 (1.5)	14.0 (1.6)	3.9 (0.7)
USDA Foods	2.3 (0.4)	9.4 (2.1)	10.5 (1.8)	2.6 (0.7)
Meals from Facility	2.0 (0.3)	3.9 (1.2)	2.8 (0.8)	3.4 (0.8)
Meals Delivered	0.7 (0.1)	1.9 (0.6)	1.8 (0.4)	1.0 (0.4)
Percent Food Insecure	15.9 (1.0)	49.0 (2.4)	45.2 (2.0)	22.4 (1.7)
Four-Category Food Security				
High	69.2 (1.6)	31.1 (2.1)	33.0 (1.9)	59.9 (2.8)
Marginal	14.8 (0.9)	19.9 (1.5)	21.7 (1.2)	17.8 (1.7)
Low	9.4 (0.6)	24.5 (1.4)	25.2 (1.4)	12.2 (1.3)
Very Low	6.5 (0.5)	24.6 (2.1)	20.0 (1.4)	10.1 (1.0)
Primary Store for Grocery Shopping				
Grocery Store	3.4 (0.8)	3.8 (1.3)	3.4 (0.9)	3.0 (0.9)
Supermarket/Superstore	94.9 (0.9)	93.7 (1.8)	95.1 (1.2)	95.0 (1.1)
Convenience/Dollar Store	0.5 (0.2)	1.8 (0.7)	0.6 (0.4)	0.7 (0.4)
Other	1.2 (0.7)	1.0 (0.4)	0.8 (0.5)	1.2 (0.7)
All Food Shopping Trips in Week				
Mean Number of Food Shopping Trips	3.5 (0.06)	3.6 (1.1)	3.8 (0.1)	3.2 (0.1)
Trips to Grocery Store	0.2 (0.02)	0.2 (0.4)	0.3 (0.04)	0.2 (0.04)
Trips to Supermarket/Superstore	2.4 (0.05)	2.3 (1.2)	2.4 (0.1)	2.2 (0.1)
Trips to Other Store Type	0.9 (0.05)	1.1 (1.0)	1.2 (0.1)	0.8 (0.1)
Mean Expenditure ($ - per trip)	36.96 (0.80)	28.73 (1.56)	30.19 (1.38)	33.30 (1.87)
Food Store only ($)	43.67 (1.08)	34.14 (1.74)	35.98 (1.32)	39.21 (1.86)
Total Expenditure ($ - all trips)	109.91 (2.76)	82.15 (3.60)	98.03 (3.20)	90.56 (4.96)
Food Store only ($)	103.80 (2.55)	77.66 (3.50)	91.89 (3.19)	87.29 (4.65)
Food Items only ($)	86.10 (2.19)	70.43 (3.94)	83.32 (3.70)	72.10 (4.02)

	All	Percentage of Households Income <=100% of FPL	SNAP Eligible, Participate	SNAP Eligible, No Participation
Mean Oneway Distance Traveled (miles - per trip)	4.1 (0.3)	3.3 (0.3)	3.6 (0.4)	3.9 (0.5)
Food Store only (miles)	4.3 (0.4)	3.4 (0.4)	3.8 (0.4)	4.0 (0.5)
Mean Driving Time (minutes - per trip)	10.1 (0.5)	8.6 (0.6)	8.8 (0.6)	9.9 (0.7)
Food Store only (minutes)	10.6 (0.6)	8.9 (0.7)	9.3 (0.6)	10.3 (0.8)
Focal Shopping Event				
Grocery Store	4.9 (0.7)	5.0 (1.2)	4.9 (1.1)	4.6 (1.3)
Supermarket/Superstore	87.8 (0.8)	81.4 (2.0)	82.4 (1.8)	88.7 (1.2)
Convenience/Dollar Store/Gas	3.5 (0.4)	8.0 (1.3)	7.6 (1.2)	4.3 (0.9)
Other Food Store	1.1 (0.2)	0.7 (0.3)	0.4 (0.2)	0.9 (0.4)
Other	2.8 (0.3)	4.9 (1.2)	4.7 (1.1)	1.6 (0.5)
Mean Expenditure ($)	65.53 (1.4)	50.37 (2.06)	57.20 (1.81)	57.04 (3.02)
Distance to Store (miles)	5.8 (0.4)	5.4 (1.3)	5.6 (1.0)	5.1 (0.8)
Driving Time (minutes - per trip)	12.1 (0.8)	10.1 (1.0)	10.9 (0.9)	11.7 (1.1)
Mean Number of Items	18.5 (0.5)	17.6 (0.9)	19.1 (0.8)	16.4 (0.6)
Unweighted N	4,825	1,197	1,581	1,066

Note: Column percentages reported unless otherwise noted. Survey weights applied. Estimated SNAP eligibility measures allow for multiple SNAP units in household and are based on gross earnings.
Source: National Household Food Acquisition and Purchase Survey (FoodAPS)

Table 3: Food Shopping Events and Expenditures among Population Sub-groups in FoodAPS

			Measure of Food Retailer Access					
Respondent Characteristics	Total Number of Food Shopping Trips	Total Food Store Expenditures ($)	Percent of Expenditures at Grocery / Supermarket / Superstore	Total Expenditures Focal Trip ($)	Total Food Item Expenditures ($)	Distance to Focal Food Retailer (one-way, miles)	Drive time to Focal Food Retailer (one-way, minutes)	N
Race								
White	3.4[ab]	117.00[ab]	92.2[ab]	70.13[ab]	90.88[ab]	6.4[ab]	13.1[ab]	2,836
Black	3.5[c]	73.54[acd]	89.3[acd]	45.75[acd]	62.04[scd]	5.7	11.5	684
Hispanic	3.7[a]	103.01[bc]	91.9[ce]	58.67[bc]	81.90[bc]	3.8[a]	8.6[a]	938
Asian	4.1[bc]	108.04[d]	94.5[bde]	61.50[d]	82.88[cd]	3.1[b]	9.0[b]	191
Household Size								
1 person	2.8[ab]	69.14[ab]	91.8	45.51[ab]	53.72[ab]	4.0[ab]	10.1[ab]	1,024
2-3 persons	3.7[ac]	118.49[ac]	91.5	70.49[ac]	91.02[ac]	6.6[a]	13.5[a]	2,210
4 or more persons	4.1[bc]	153.22[bc]	92.6	84.66[bc]	123.82[bc]	6.6[b]	12.3[b]	1,591
SNAP Eligible (R4)								
SNAP Participant	3.8[a]	98.03	89.3[a]	57.20	83.32[a]	5.6	10.9	1,581
SNAP Eligible, Not Participating	3.2[a]	90.56	92.5[a]	57.04	72.10[a]	5.1	11.7	1,066
HH's with Income <=200% FPL								
Car	3.6	88.29[a]	91.8[a]	53.37[a]	72.16[a]	6.5[a]	12.4[a]	2,047
No Car	3.4	72.24[a]	86.9[a]	45.24[a]	57.05[a]	3.9[a]	9.1[a]	650
Physical Health								
Fair/Poor	3.4	95.31[a]	89.9[a]	60.29	77.13[a]	4.2[a]	10.0[a]	1,206
Good/Very Good/Excellent	3.5	112.90[a]	92.3[a]	66.61	87.95[a]	6.1[a]	12.6[a]	3,619
Geography								
Urban County	3.5	107.46[ab]	91.7	63.17[a]	87.12[ab]	4.0[ab]	9.5[ab]	
Suburban County	3.6	121.07[ac]	92.4	70.11[ab]	95.80[bc]	5.5[ac]	11.8[ac]	
Rural County	3.3	97.57[bc]	91.4	62.72[b]	73.41[bc]	9.3[bc]	17.2[bc]	
Unweighted N = 4,825								

Note: Column percentages reported unless otherwise noted. Survey weights applied. Estimated SNAP eligibility measures allow for multiple SNAP units in household and are based on gross earnings. Geographic location sample sizes are not reported to protect against potential disclosure of respondent location. [a,b,c,d] - Indicate that the difference of means between two cell pairs within the same panel and column are statistically significant at .10 or below. Difference of means tests not adjusted for PSU clustering effects.
Source: National Household Food Acquisition and Purchase Survey (FoodAPS)

Table 4: SNAP-licensed food retailer access among population sub-groups in FoodAPS

	Measure of Food Retailer Access					
	Distance to Nearest (miles)		Number of SNAP Supermarkets			
Respondent Characteristics	SNAP Supermarket	SNAP Convenience Store	Within 1 Mile	Within 5 Miles	Within 10 Miles	N
Race						
White	4.0 (0.5)[abc]	2.1 (0.3)[ab]	0.6 (0.1)[abc]	7.7 (1.3)[abc]	22.5 (4.4)[abc]	2836
Black	1.7 (0.3)[a]	0.8 (0.1)[a]	1.0 (0.1)[ad]	13.0 (2.0)[ad]	41.6 (8.2)[ad]	684
Hispanic	1.2 (0.1)[b]	1.3 (0.6)	1.3 (0.3)[be]	22.6 (6.6)[b]	76.6 (20.0)[b]	938
Asian	1.1 (0.2)[c]	0.6 (0.1)[b]	2.6 (0.7)[cde]	30.5 (9.2)[cd]	90.1 (24.8)[cd]	131
SNAP Eligible (R4)						
SNAP Participant	2.6 (0.5)	1.2 (0.1)[a]	1.0 (0.1)	12.2 (2.3)	36.6 (8.2)	1,581
SNAP Eligible, Not Participating	3.1 (0.7)	1.6 (0.3)[a]	1.0 (0.2)	13.5 (3.1)	44.7 (12.2)	1,066
Geography						
Urban County	1.5 (0.2)[*+]	0.8 (0.1)[*+]	1.2 (0.2)[*]	16.5 (3.4)[*]	51.3 (13.5)[*]	
HH <=100% of FPL	1.2 (0.2)[abdg]	0.6 (0.1)[agj]	1.4 (0.2)[ad]	18.6 (3.5)[ac]	55.7 (12.5)[a]	
HH 100-200% of FPL	1.5 (0.2)[aeh]	0.6 (0.1)[bhk]	1.2 (0.2)[e]	18.2 (4.6)[d]	62.5 (22.6)[b]	
HH +200% of FPL	1.6 (0.2)[bfi]	0.8 (0.1)[abil]	1.1 (0.2)[af]	15.5 (3.0)[ae]	46.9 (11.3)[c]	
Suburban County	2.8 (0.4)[*‡]	2.1 (0.3)[*‡]	0.7 (0.2)	12.0 (4.4)[+]	37.8 (14.2)[+]	
HH <=100% of FPL	2.7 (0.7)[dj]	1.3 (0.3)[cdg]	1.1 (0.5)	16.4 (9.1)	52.6 (31.6)	
HH 100-200% of FPL	2.6 (0.4)[ek]	1.7 (0.3)[ch]	0.7 (0.3)	13.1 (6.6)[f]	40.5 (19.4)[d]	
HH +200% of FPL	2.9 (0.4)[fl]	2.3 (0.4)[dim]	0.7 (0.2)	11.3 (3.6)[g]	35.8 (11.5)[e]	
Rural County	6.6 (1.3)[+‡]	3.0 (0.3)[+‡]	0.4 (0.1)[*]	1.4 (0.3)[*+]	2.3 (0.4)[*+]	
HH <=100% of FPL	5.0 (1.1)[cgj]	2.0 (0.4)[ej]	0.5 (0.1)[bcd]	1.6 (0.2)[bc]	2.4 (0.4)[a]	
HH 100-200% of FPL	7.0 (1.8)[hk]	2.4 (0.4)[fk]	0.3 (0.1)[be]	1.3 (0.2)[bdf]	2.2 (0.4)[bd]	
HH +200% of FPL	6.9 (1.3)[cil]	3.4 (0.4)[eflm]	0.4 (0.1)[cf]	1.4 (0.3)[eg]	2.3 (0.4)[ce]	
Unweighted N = 4,825						

Note: Column percentages reported unless otherwise noted. Survey weights applied. Estimated SNAP eligibility measures allow for multiple SNAP units in household and are based on gross earnings. Geographic location sample sizes are not reported to protect against potential disclosure of respondent location. [a,b,c,d, e, f, g, h, I, j, k, l, m] - Indicate that the difference of means between two cell pairs within the same panel and column are statistically significant at .10 or below. [*, +, ‡] - Indicate that the difference of means between two cell pairs within the same panel and column are statistically significant at .10 or below. Difference of means tests not adjusted for PSU clustering effects.
Source: National Household Food Acquisition and Purchase Survey (FoodAPS)

Table 5: Ranking of Top 12 Products Bought by SNAP Participants and Eligibles, by Share of Total Expenditures

Food Items	All Shoppers and Trips		All Focal Shopping Trips		All Trips, SNAP Participants		Focal Trips, SNAP Participants		All Trips, SNAP Eligible Non-Participants		Focal Trips, SNAP Eligible Non-Participants	
	Number of Purchases	Rank	Number of Purchases	Rank	Number of Purchases	Rank	Number of Purchases	Rank	Number of Purchases	Rank	Number of Purchases	Rank
SODA	3657	1	1676	2	1528	1	635	2	1767	1	782	2
MILK	2843	2	1443	3	996	2	457	4	1317	2	638	3
CHEESE	2416	3	1584	1	776	3	489	1	985	3	643	1
READY TO EAT CEREAL	1911	4	1213	4	652	4	379	3	815	4	501	5
CHICKEN	754	5	559	5	305	5	223	5	353	5	257	4
BREAD	2469	6	1394	7	825	6	443	8	1119	6	655	7
LUNCHMEAT	1211	7	811	6	495	7	330	7	593	7	408	6
JUICE	1145	8	673	10	337	11	178	13	461	9	250	11
BEEF	489	9	368	8	197	8	131	6	222	10	157	8
PREPARED ENTREE	1319	10	916	9	466	10	295	9	501	11	332	9
INFANT FORMULA	112	11	N/A	N/A	54	9	N/A	N/A	84	8	N/A	N/A
PIZZA	872	12	611	11	325	12	230	10	371	12	265	10

Source: National Household Food Acquisition and Purchase Survey (FoodAPS).

Table 6: Percentage of Total Shopping Trip Expenditures Going to Selected Goods, by Type of Shopper and Trip

Food Items	All Shoppers and Trips	All Focal Shopping Trips	All Trips, SNAP Participants	Focal Trips, SNAP Participants	All Trips, SNAP Eligible Non-Participants	Focal Trips, SNAP Eligible Non-Participants
SODA	4.1	3.3	4.6	3.6	4.4	3.5
MILK	4.0	3.2	4.0	3.0	4.2	3.3
CHEESE	3.2	3.6	3.3	3.8	3.2	3.6
READY TO EAT CEREAL	2.7	2.8	2.9	3.0	2.7	2.8
CHICKEN	2.3	2.6	2.4	2.8	2.5	2.9
BREAD	2.1	2.0	2.0	1.8	2.1	2.0
LUNCHMEAT	1.7	2.0	1.8	2.1	1.8	2.1
JUICE	1.6	1.5	1.5	1.2	1.6	1.4
BEEF	1.5	1.8	1.7	2.1	1.5	1.8
PREPARED ENTREE	1.5	1.6	1.7	1.7	1.5	1.6
INFANT FORMULA	1.3	N/A	1.7	N/A	N/A	N/A
PIZZA	1.2	1.4	1.3	1.5	1.2	1.4
Total Share of All Items	27.4	25.9	28.9	26.6	28.5	27.6

Source: National Household Food Acquisition and Purchase Survey (FoodAPS).

Table 7: Relative Prices by Shopper and Trip Type (Mean Index Value for All Shoppers and Trips = 1.00)

Food Items	All Shoppers and Trips	All Focal Shopping Trips	All Trips, SNAP Participants	Focal Trips, SNAP Participants	All Trips, Eligible Non-Participants	Focal Trips, Eligible Non-Participants
SODA	1.00	1.09	0.96	1.09	0.94	1.02
MILK	1.00	1.00	0.99	1.00	1.00	1.00
CHEESE	1.00	1.01	1.00	1.02	0.98	1.00
READY TO EAT CEREAL	1.00	1.01	1.02	1.03	0.99	1.00
CHICKEN	1.00	1.00	1.01	1.02	0.97	0.99
BREAD	1.00	1.01	0.90	0.91	0.94	0.95
LUNCHMEAT	1.00	1.05	0.95	0.98	0.98	1.00
JUICE	1.00	1.04	1.02	1.08	0.99	1.01
BEEF	1.00	1.00	1.04	1.06	0.98	1.02
PREPARED ENTREE	1.00	0.99	0.97	0.99	1.00	1.02
PIZZA	1.00	0.98	0.95	0.89	0.89	0.87
All Items	1.00	0.99	0.97	0.95	1.01	1.00
Standard Deviation, All items	0.019	0.017	0.016	0.017	0.021	0.019

Note: See Table 5 for total number of times each item was purchased by trip and shopper type. Price indices are based on trips to stores where price data were available for at least 5 of the items listed. These 7021 trips represented 65 percent of all shopping trips. See text for details.

Source: National Household Food Acquisition and Purchase Survey (FoodAPS).

Table 8: Relative FoodAPS Food Prices by Location – All Stores
(Mean Index Value for All Shoppers and Trips = 1.00)

Location	Mean	Standard Deviation
Urban	0.99	0.018
Suburban	1.03	0.033
Rural	0.97	0.018
All Areas	1.00	0.018

Note: Mean prices and number of trips shown are based on trips to stores where prices for at least 5 items in the index were available, a total of 870 stores. A total of 7,021 trips are included in the price index calculation. These trips were 65 percent of all trips. See text for details. Sample size for geographic location is omitted to protect against potential disclosure of respondent location.
Source: National Household Food Acquisition and Purchase Survey (FoodAPS).

Table 9: Factors Associated with Food Outcomes - All HHs

	Household Outcome			
Respondent Characteristics	Total Food Store Expenditures (in $)	Percent of Expenditures at Food Stores	Focal Trip at Grocery or Supermarket	HH Food Insecurity
Black	-30.94***	-0.00686	-0.244	0.283
	(8.332)	(0.0124)	(0.287)	(0.180)
Hispanic	-26.31***	-0.000884	0.336	0.374**
	(6.114)	(0.00822)	(0.290)	(0.143)
Asian	-26.02	0.0282*	2.321***	-0.0888
	(16.69)	(0.0142)	(0.695)	(0.289)
Other/Multi-race	-25.03**	-0.0240	-0.659	0.693**
	(12.42)	(0.0285)	(0.513)	(0.275)
Married	19.40***	-0.0106	0.0659	-0.403***
	(7.028)	(0.00835)	(0.200)	(0.150)
No BA Degree	-13.41**	0.00650	-0.167	0.636***
	(5.613)	(0.00972)	(0.325)	(0.215)
Fair or Poor Health	2.539	-0.0138	-0.159	0.611***
	(7.772)	(0.0126)	(0.282)	(0.111)
BMI	0.268	0.000815	0.0252	0.0241**
	(0.394)	(0.000604)	(0.0153)	(0.0102)
Household Size	20.64***	0.00102	0.160*	0.0289
	(2.434)	(0.00304)	(0.0825)	(0.0345)
Age	0.108	0.000126	0.0155**	-0.0173***
	(0.125)	(0.000212)	(0.00684)	(0.00405)
Has Access to a Car	6.774	0.0517***	1.129***	-0.387**
	(4.840)	(0.0158)	(0.226)	(0.179)
Urban County	10.37*	0.00656	0.468*	0.0874
	(5.786)	(0.00970)	(0.242)	(0.119)
Suburban County	10.22	0.00777	0.0642	0.0105
	(6.992)	(0.0110)	(0.257)	(0.144)
SNAP Eligible, Not Participating	-7.979*	-0.00568	0.234	0.307
	(4.405)	(0.0110)	(0.321)	(0.196)
SNAP Participant	-3.713	-0.0153	-0.0935	0.770***
	(7.118)	(0.0125)	(0.288)	(0.177)
Income to Poverty Threshold (%)	0.0179***	0.00000182	0.000243	-0.00332***
	(0.00622)	(0.00000640)	(0.000413)	(0.000527)
Constant	35.15**	0.844***	-0.478	-1.363***
	(17.25)	(0.0260)	(0.564)	(0.459)

	Household Outcome			
	Total Food Store Expenditures (in $)	Percent of Expenditures at Food Stores	Focal Trip at Grocery or Supermarket	HH Food Insecurity
Access Measures				
Dist. to Nearest SNAP Supermarket	-0.570	-0.00101**	-0.000297	-0.000181
	(0.514)	(0.000494)	(0.000930)	(0.000806)
Dist. to Nearest SNAP Convenience Store	0.0586	0.000731	0.00308*	-0.00654**
	(0.974)	(0.00104)	(0.00165)	(0.00249)
# SNAP Supermarkets in 1 mile	2.098	-0.00277	-0.00639	0.00831
	(1.577)	(0.00511)	(0.00639)	(0.00523)
# SNAP Supermarkets in 2 miles	1.287*	-0.00157	-0.00241	0.00287
	(0.704)	(0.00146)	(0.00205)	(0.00206)
# SNAP Supermarkets in 5 miles	0.141	-0.000332	-0.000479	0.000418
	(0.121)	(0.000214)	(0.000329)	(0.000291)
Observations	4083	4074	4265	4718
R-squared	0.160	0.016		

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: National Household Food Acquisition and Purchase Survey (FoodAPS).