The Scope and Magnitude of Food Sharing Among U.S. Households: New Evidence from FoodAPS

PRELIMINARY AND INCOMPLETE – DO NOT CITE

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Abstract

Low-income households use informal food sharing as a means of coping with limited resources. This paper documents the importance of informal food sharing for low-income groups. Specifically we study the relationship between household food security status, SNAP participation and food sharing behaviors. Using the USDA's National Household Food Acquisition and Purchase Survey (FoodAPS) data, we find that food-secure SNAP participants tend to receive more free meals than food-secure nonparticipants with incomes below poverty line, while food-insecure SNAP participants tend to receive more free meals than food-insecure nonparticipants with income above 185% poverty line.

1 Introduction

Food security, access by all people at all times to enough food for an active and healthy life, is one of the several conditions necessary for a population to be healthy and well nourished (Coleman-Jensen et al. 2011). The scale and negative impacts of the food insecurity is among the most important nutrition-related public health issues in the U.S and a matter of considerable interest to policy makers. In response to the problem of hunger and food insecurity, the public and private sectors designed a wide variety of food assistance programs to America's vulnerable low-income populations. However, individuals with limited resources also developed coping mechanisms outside of these food assistance programs. Many have obtained informal support from personal social networks through reciprocal food gifts. This food sharing behavior presents its own advantages as an informal, easily accessible coping mechanism and has gradually risen in prevalence among low-income households.

This paper examines the scope and magnitude of food sharing among the US households, focusing on low-income households. We use a unique and recently released data set, National Household Food Acquisition and Purchase Survey (FoodAPS), which contains information on food sharing behavior, SNAP participation and demographic characteristics of a national representative sample of 4,826 households. We ask whether food security status is related to different levels of food sharing behavior, and how this relationship is associated with participation in SNAP.

Food sharing has been systematically and widely studied in many developing countries (Fafchamps and Lund 2003; Harrower and Hoddinott 2005), as a coping strategy to maintain an adequate supply of food and avoid food insecurity. Many studies have also documented the application of sharing or receiving free food from relatives or friends by low-income households to protect themselves against hunger in different time periods in the United States (Ahluwalia, Dodds, and Baligh 1998; Martin et al. 2004; Swanson et al. 2008; Winne 2008). Informal food sharing can be used as a substitute for food pantries or the "second-best" choice if households cannot get support from food banks.

Many low-income households eat at relative's or friend's or receive free food from them either regularly, chronically, or during specific times of needs (Mabli et al. 2010; Wimer, Wright, and Fong 2013).

Relative to formal food sharing programs, the academic literature has paid less attention to food sharing behavior. Food sharing offers some advantages as an informal coping strategy for dealing with short run food access. It is socially, culturally acceptable; it provides a way to obtain emotional support from friends or family. Receiving food through social networks does not require an application to a public assistance program, juggling work schedules and food pantry hours or waiting in lines. It may face lower transaction costs and social stigma related to receiving food support from either government programs or food pantries. In contrast to attempting to cope on their own, interpersonal transfers do not require households to forgo other resources, like medical supplies or heating resources, and thus make it easier to retain other dimensions of well-being. Receiving food through social networks may also have implications for diet quality; rather than consuming unhealthy high-calorie, storable foods which may help a household cope without involving outside help, food sharing may allow access to more perishable, healthier foods.

This paper provides initial findings from FoodAPS on the food sharing behaviors of households, comparing patterns in behavior across SNAP participation status, income groups and food security status. Food sharing as a method of increasing food security is understudied in the developed context, especially when compared with the large body of literature on food sharing in the developing world. This study adds to the literature about how low-income families meet food needs through the use of both formal and informal supports. Another contribution of this work is attributed to the data set we use. Previous work focusing on food-sharing strategies in the U.S. context suffers from small sample sizes and limited regional scope. The FoodAPS data set increases the generalizability of analysis by providing a nationally representative sample. The time frame of the survey, from April 2012 to January 2013, permits us to make up-to-date observations regarding the food-sharing behavior of different groups of households.

The paper proceeds as follows: Section 2 addresses some institution background and context. Section 3 describes the data set, and construction of variables, and also presents some summary statistics of key variables in the data. Section 4 outlines our empirical approach for our analysis. Section 5 discusses the results and Section 6 concludes.

2 Background

Millions of Americans are food insecure and the number of food insecure households has increased in recent years (Gundersen, Kreider, and Pepper 2011). At last count, an estimated 14.3 percent (17.5 million households) in the United States were classified as food insecure at some point during 2013 (Coleman-Jensen, Gregory, and Singh 2013). The safety net to protect low-income households against food insecurity consists of the food assistance systems provided by the government and voluntary private sector, as well as informal support from personal social networks. In this section, we provide background on the institutions that provide food assistance and review the phenomenon of food sharing. In addition, we discuss the difficulties in characterizing the relationship between food sharing and food assistance program participation or food insecurity status.

Public Food Assistance Programs

The United States has a wide variety of food assistance programs designed to address food insecurity. These public programs include the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and School Lunch and Breakfast Programs (Robaina and Martin 2013). Among public programs mentioned above, the SNAP is the largest federal nutrition assistance program and with the goal of eliminating food insecurity. To be eligible for SNAP participation, households must meet three financial criteria, including a gross income test, a net income test, and an asset test. Households who participate in other welfare assistance programs may also be categorically eligible. For eligible participating households, the level of benefits received is determined by both family size and income level. Benefit distributed via Electronic Benefit Transfer (EBT) cards can be used for the purchase of food in authorized retail food stores.

The SNAP program has decades of history in the fight against food insecurity. Originally called the Food Stamp Program, the program was introduced in the early 1960s and experienced many changes to its design and administration. Starting from 2002, all states were required to deliver the benefit through Electronic Benefit Transfer (EBT) cards. The transition to EBT cards was expected to reduce administration costs, fraud, and the stigma associated with food stamp coupons. In 2008, the program was officially renamed SNAP, the Supplemental Nutrition Assistance Program, in order to address the new focus on nutrition. Due to the "Great Recession" of 2007-2008 and increased unemployment, SNAP enrollment increased and the maximum SNAP benefit was increased 14% through the American Recovery and Reinvestment Act (ARRA). In 2014, SNAP served approximately 46.5 million individuals at a total program

expenditure of over $70 billion.

Voluntary Food Assistance System

In additional to the formal government assistance, the voluntary sector plays a valuable role through the Emergency Food Assistance System (EFAS), which consists of food pantries, food banks, soup kitchens, shelters etc. These charitable organizations complement the public program, and sometimes reach people who may not be able to acquire sufficient food through government programs (Ohls et al. 2002).

The EFAS is built outside the formal public food assistance program, but it has direct connection with the Federal government through the provision of commodities to the EFAS through two USDA programs: the Emergency Food Assistance Program (TEFAP) and the Commodity Supplemental Food Program (CSFP). Food banks, food rescue organizations, and emergency food organizations play the "wholesaler" role of the EFAS. They obtain food in bulk from major food companies, grocery stores, restaurants, commodity exchanges, individual donors, and food purchased with donations, and also from both TEFAP and CSFP (Gundersen, Kreider, and Pepper 2011). Supported by food banks and other "wholesalers," local-based food pantries and emergency kitchens play the role of the direct service provider in EFAS and distribute food to needy households. Food pantries and emergency kitchens provide both non-prepared foods and other grocery products for off-site/taken away or home consumption, and prepared meals for onsite consumption.

Feeding America, a national network of voluntary food assistance programs, emerged to deliver free food to the needy. The result has been a substantial increase in the provision of charitable food assistance. Over the past three decades it served an estimated 46.5 million population.

Informal Food Sharing

To date, food assistance programs provided by both the public sector and voluntary organizations have received a great deal of public and policy attention. There is no doubt that a large portion of the vulnerable population relies on the support provided by these two actors to maintain an adequate food supply. However, individuals with limited resource may also utilize other coping strategies avoid food insecurity. These include dumpster diving, borrowing money for food, buying food on credit, and so on (Winne 2008). One of the most important of these coping strategies is informal food sharing.

Informal food sharing includes getting food (raw material and/or fully cooked meals) from friends or relatives for home consumption, eating at someone else's home, and sending children to someone else's house to eat (Winne 2008). Food received from social networks was found to co-exist, complement, and sometimes substitute for other community-based informal food assistance like food pantries. Some studies found that one reason that some low-income households never utilized service provided by food pantries is that they received food from social networks. Family members were reported to be the first line of assistance in which mothers played an especially important role, followed by friends and neighbors (Ahluwalia, Dodds, and Baligh 1998; Swanson et al. 2008; Wimer, Wright, and Fong 2013). Social capital, including social life skills, through which one may strengthen social networks, is also found to be associated with protecting against food insecurity (Martin et al. 2004).

However, the relationship between food insecurity and the use of food sharing is complex. First, there may be endogeneity between food insecurity and application of food sharing behavior as a coping strategy. Since people receive food from others to reduce the severity of food insecurity, households are expected to be more food secure after engaging in food sharing. On the other hand, it is precisely less food-secure households that seek assistance from relatives or families.

Likewise, the relationship between informal food sharing and participation in formal government assistance programs is unclear. SNAP's regular monthly benefit provides regular income to households. This could have two possible opposing effects on food sharing behavior. First the SNAP benefit could increase the ability of the household to give away food to needy friends or relatives, increasing its chance of receiving food in times of need. On the other hand, public food assistance could serve as a substitute for informal food sharing, crowding out informal food sharing behavior for SNAP participating households.

Further complications arise because simply observing food-sharing behavior is not sufficient to identify its purpose. Even though food sharing is a powerful coping strategy, not every single occurrence can be identified as guarding against food insecurity. For example, it may be an opportunity for social interaction between participants regardless of food security status (Swanson et al. 2008). Considering these underlying difficulties, we are not able to claim any causal relationships in our findings at this point.

3 Data

FoodAPS is the first nationally representative survey to collect comprehensive data about American household food purchases and acquisitions, both for at-home and away-from-home consumption over the course of one week, along with rich information about the socio-demographic characteristics. The sample of FoodAPS includes 4,826 households including SNAP households, low-income households not participating in SNAP ("eligible non-participants"), and higher income households.

FoodAPS is unique in that it contains data on food-at-home (FAH) *and* food-away-from-home (FAFH) acquisition from *all* sources by all household members, which includes not only purchased food, but also foods acquired for free. Thus, the survey includes information on food received from emergency systems (e.g. food banks, food pantries and places of worship), as well as food received through informal food-sharing behavior (e.g. food given by a relative or friend for at-home consumption, and meals consumed at the home of a relative or friend). Besides food acquired by interviewees, FoodAPS gathered information on household behavior regarding inviting guests to meals, which comprise both directions of food sharing, receiving and giving away food.

Construction of variables

SNAP participation and other income groups

One advance of FoodAPS data in terms of analysis of SNAP participants' behavior is that it includes data from the respondents' administrative records, matched after obtaining the respondent's consent. A majority of the survey respondents (97.5 percent of the sample) consented to have their SNAP administrative records matched to their survey response, in which case SNAP participation status in the prior 30 days was determined by the administrative record. For the 122 households who did not consent, the survey response is used to determine participation status (Ver Ploeg et al. 2015).

We classify the sample into four groups: SNAP households and nonparticipating households in three income groups: those with incomes below and at 100 percent of Federal poverty threshold (FPL), above 100 percent of FPL but no greater than 185 percent of FPL, and above 185 percent of FPL.

Food Insecurity

Food security status is based on the 10 questions used to assess household food security status in USDA's 30-day Adult Food Security Scale. We classify those households into food insecurity status if they were scored as having low or very low food security, while all other households were classified as food secure. This food security status is

evaluated for the prior 30 days, and scoring procedures used were consistent with those defined by Bickel et al. 2000. Using this measure, we construct a dummy variable 'Food Insecure', where the value of one indicates that a household is food insecure, and zero indicates food secure status.

Food sharing behavior

Even though only receiving food from others can be used to protect one from food insecurity and hunger, giving out food to others is also of interest for several reasons. Several studies have found that interpersonal reciprocal transaction of gifts is one important conditions for being involved in an informal risk sharing arrangement. In other words, people need to "give back" something to avoid being excluded from a social network with gift transaction (Clément 2008; Bhattamishra and Barrett 2010). Thus, a household may be still involved in informal food sharing arrangement to guard themselves against food insecurity even though we only observe they gave out food in the survey week. To capture a complete picture of food sharing behavior among respondents, we investigate both food given and received.

Food received from family and friends

FoodAPS collected detailed data on the source of where households got food and whether the acquired food was free or not. Family and friends is one important source for both FAH and FAFH, including raw material like grocery products and cooked meals received from family and friends for at-home consumption, and cooked meals ate at families' and friends' places. Other than locations, we have detailed information about received food, including on which day, and which household members received or ate which meals. We build a continuous variable for total number of received meals from friends or relatives in the course of 7 days, which count breakfast, lunch, and dinner, and zero value refers to no received food during the survey week.

Food given: inviting guests to meals

The survey also contains information on whether and when households invited guests to meals on each day in the data collection week. We constructed a continuous variable of total number of meals given away by households, including breakfast, lunch, and dinner, and zero refers to no meals given away to guests during the survey week.

Table 1 through Table 4 presents summary statistics on the scope of respondents' food sharing behavior overall and for each income group and food security status. Before discussing interpersonal food transfers, we compare the prevalence of free food received from family and friends, which is potentially a means of informal food assistance from social networks, to the presence of free food from emergency food providers (food banks, food pantries, and places of worship).

In Figure 1, we plot the total number of free meals received from friends and relatives and free meals received from emergency food systems (food banks, food pantries, and places of worship) for all households in the sample. For FAFH, we report received food at a detailed meal level, including breakfasts, lunches, dinners, and snacks. We see a dominating prevalence from the source of social networks (e.g. from friends and relatives) over the source from emergency food systems (e.g. from food banks, food pantries, and places of worship). This gap becomes narrower when we move to food-at-home (FAH), but the number of meals from friends and relatives is still larger than the one from food pantries. We further limit our observation to the free food received by only SNAP participating households. As shown in Figure 2, we can tell that the source of friends and family dominates the source of food banks, food pantries and so on. Among free meals eaten at relatives' and friends', dinner is the most commonly shared one, followed by lunch. The higher incidence of food received from social networks than emergency food system brings the topic of informal food sharing into our attention. This also motivates us to further investigate the involvement of households into food sharing arrangement from different subgroups of interest.

Table 1 reports the food security status overall and for each subgroup. Other than the four income groups mentioned in the last section, we also divide sample into two subgroups based on whether a household reported any food sharing behavior in the survey week. In total, we find that 16 percent of FoodAPS households were food insecure at some point in the 30 days prior to the survey. There is significant variation in the share of food insecure households among income groups; the share of food-insecure households among SNAP participants is 44 percent, which is significantly higher than the share of nonparticipants whose incomes are above federal poverty line. The share of food insecure households for those who had any food sharing behavior - both receiving and giving away food - is not significantly different from that of the overall population.

Table 2 summarizes the share of households that engaged in food sharing and the mean number of shared meals conditional on reporting any shared meals. 26 percent of all households received at least one free meal from friends or relatives, with an average of 1.91 meals received over the week. 27 percent of all households invited at least one guest to meals in the survey week, and gave out an average of 2.93 meals. A larger share of SNAP participants tend to receive at least one free meal compared to any of the other income groups, while non-SNAP participants with income above 185% FPL have the highest portion of households that gave out at least one meal. Although we observe variation in the share of the households with any food sharing behavior across income

groups, the only statistically significant difference is between SNAP participants and non-SNAP participant whose income is below poverty level. 23 percent of these non-SNAP participants ever received any free meals from friends and relatives, while 29 percent of SNAP participants did. We do not observe a difference between food-secure and food-insecure households in this analysis.

Considering the variation in the share of food-insecure households across income groups, we further break sample into food-secure and food-insecure households within each income group. Tables 3 and 4 present the same content as Table 2, but allow us to examine the existence of food sharing behavior interacted with food security status and income group simultaneously. For the share of households that received any free food from friends and relatives among eight subgroups, food-insecure SNAP participants have the highest percentage (30 percent) while food-secure nonparticipants with income below poverty line have the lowest (20 percent). The percentage of households that invited any guests to meals is more equal among subgroups; food-secure nonparticipants above 185% FPL have slightly higher frequency than other groups with 28 percent of them having invited any guests to meals.

4 Empirical Approach

For our empirical approach, we examine the relationship between food security status and food sharing behaviors, taking SNAP participation status into account. Given the unclear relationship between food sharing behavior and food security status, we run two sets of regressions separately. First, we use the total number of shared meals as the dependent variables and food insecurity status as the explanatory variable. Then we regress the total number of shared meals on food insecurity status. We construct a serious of dummy variables for the three non-SNAP participating income groups, where the value of one indicates that responding household is among the corresponding subgroup in the past month, and zero indicates not being in that group. SNAP participation is omitted as the base level to be compared with. Dummy variables of being in a SNAP/income group are put into the regression as explanatory variables, and are also interacted with the other explanatory variable, either food insecurity status, or the total number of shared meals. The interacted terms allow us to test the relationship both across and within income and food security groups.

We include some other variables to control for household-level characteristics. These include log of the household size, log of the share of young children under the age of 6 in the household, log of the share of old children with age between 11 and 18 in the household. We also include demographic variables for the primary respondent who is

the main food grocery shopper or meal planner; these include gender, age, race, and education represented by four categories of educational levels. We also include state and month dummy variables to control for unobservable factors related to differences in food sharing behavior by location and month.

5 Results

Tables 5 and 6 present our main findings. As discussed before, the relationship between food sharing behavior and food security status as well as the one between food sharing behavior and SNAP participation can be complex and endogenous. Combined with the unclear intent of the food sharing activity reported in the survey, we are unable to draw causal relationships in our findings. In food-secure households, SNAP participants tend to receive more free food from friends or family than nonparticipants with incomes below the poverty line. In food-insecure households, SNAP participants are more likely to receive free food than nonparticipants in the highest income group. The relationship between food security and food sharing is only statistically significant when comparing across rather than within income groups; more shared meals are negatively associated with food insecurity for those households who are nonparticipants of SNAP with incomes above poverty line.

Table 5 shows the result for total number of shared meals, meals received free from family and friends, and meals shared by invited guests. For SNAP participating households, food insecurity is positively associated with the number of shared meals both received and given, but the relationship is not statistically significant. Then we compare food-secure households among three non-SNAP income groups to food-secure SNAP participants. For food-secure households, being in any of the three non-SNAP income groups is a negative predictor for a larger number of received meals, but a positive predictor for given meals, compared with SNAP participants. One coefficient worth notation is the dummy variable for the group of non-SNAP participants with incomes below 100% of the FPL; it is negatively and significantly associated with the number of received meals. Since receiving free food from relatives or friends might be a coping strategy against food shortage, we did see the involvement in this activity vary across SNAP participation status for food secure households. Finally, we move to the food-insecure households who do not participate in SNAP, and compare them to the base category, SNAP participants. Being nonparticipants, compared with being SNAP participants, as a food-insecure household is negatively associated with the number of shared meals, both received and given ones. Among these coefficients, the one for being in non-SNAP participants with more than 185% FPL, the highest income group, is the only significant one and has the largest scale. It indicates that food-insecure "rich" non-

SNAP participants, who are classified into the highest income group among the survey respondents, are less likely to receive free food from friends or relatives compared with the food-insecure SNAP participants.

Table 6 shows the result for regressions with food insecurity as the dependent variable. Before discussing the relationship between food insecurity and food sharing behavior, we look at food insecurity status among different income groups. It indicates that the two non-SNAP groups, with incomes between 101- 185 % FPL and above 185% FPL are less likely to be food insecure when compared with the SNAP participant group. Because recent literature has found an endogenous relationship between SNAP participation and food security status (Ratcliffe, McKernan, and Zhang 2011; Nord and Golla 2009), we do not conclude this as a casual relationship. Then we look at the comparison across income groups. Compared with SNAP participants, households with higher number of shared meals are less likely to be food insecure, whereas this negative correlation between food sharing and food insecurity is significant among the two highest income groups. This corresponds with the result in the table above, and implies significant variation in food sharing behavior among relatively high-income non-SNAP participants and dependent food security status. Finally, we move to the analysis within each income group. The relationships between the number of shared meals and food insecurity status are either positive or negative, but all are insignificant and are small in magnitude. It implies that it is difficult to capture the relationship between food sharing and food insecurity within income groups without identifying the purpose of food sharing activity.

6 Conclusion

This paper uses a unique data set to document the frequent usage of food sharing behavior among households. Our results indicate that engagement in food sharing behavior is different between households in different income groups and with different SNAP participation statuses and that this relationship is dependent on the food security status. We do not over-interpret our results into a causal relationship between food sharing, food insecurity and SNAP participation, but they do imply that those households that are food insecure and in a certain income groups engage in food sharing activities differently. Our paper adds to the literature by providing some initial findings on informal food sharing behaviors among households, where existing literature is restricted by small samples and regional scope. Further investigation needs to be done in order to identify whether some households utilize food sharing to cope with risk of food insecurity and how they achieve that, if they do so.

References

Ahluwalia, Indu B., Janice M. Dodds, and Magda Baligh. 1998. "Social Support and Coping Behaviors of Low-Income Families Experiencing Food Insufficiency in North Carolina." *Health Education & Behavior* 25 (5): 599–612.

Bhattamishra, Ruchira, and Christopher B. Barrett. 2010. "Community-Based Risk Management Arrangements: A Review." *World Development* 38 (7): 923–32.

Clément, Matthieu. 2008. "The Relationship between Private Transfers and Household Income with Regard to the Assumptions of Altruism, Exchange and Risk Sharing: An Empirical Analysis Applied to Russia." *Post-Communist Economies* 20 (2): 173–87.

Coleman-Jensen, Alisha, Christian Gregory, and Anita Singh. 2013. "Household Food Security in the United States in 2013."

Coleman-Jensen, Alisha, Mark Nord, Margaret Andrews, and Steven Carlson. 2011. "Household Food Security in the United States in 2010." *USDA-ERS Economic Research Report*, no. 125.

Fafchamps, Marcel, and Susan Lund. 2003. "Risk-Sharing Networks in Rural Philippines." *Journal of Development Economics* 71 (2): 261–87.

Gundersen, Craig, Brent Kreider, and John Pepper. 2011. "The Economics of Food Insecurity in the United States." *Applied Economic Perspectives and Policy*, ppr022.

Harrower, Sarah, and John Hoddinott. 2005. "Consumption Smoothing in the Zone Lacustre, Mali." *Journal of African Economies* 14 (4): 489–519.

Mabli, James, Rhoda Cohen, Frank Potter, and Zhanyun Zhao. 2010. "Hunger in America 2010 National Report Prepared for Feeding America." Mathematica Policy Research.

Martin, Katie S., Beatrice L. Rogers, John T. Cook, and Hugh M. Joseph. 2004. "Social Capital Is Associated with Decreased Risk of Hunger." *Social Science & Medicine* 58 (12): 2645–54.

Nord, M., and A. Golla. 2009. "Does SNAP Decrease Food Insecurity? Untangling the Self-Selection Effect. USDA." *Economic Research Service*.

Ohls, James C., Fazana Saleem-Ismail, Rhoda Cohen, and B. Cox. 2002. *The Emergency Food Assistance System: Findings from the Provider Survey*. US Department of Agriculture, Economic Research Service.

Ratcliffe, Caroline, Signe-Mary McKernan, and Sisi Zhang. 2011. "How Much Does the Supplemental Nutrition Assistance Program Reduce Food Insecurity?" *American Journal of Agricultural Economics*, aar026.

Robaina, Kate A., and Katie S. Martin. 2013. "Food Insecurity, Poor Diet Quality, and Obesity among Food Pantry Participants in Hartford, CT." *Journal of Nutrition Education and Behavior* 45 (2): 159–64.

Swanson, Josephine A., Christine M. Olson, Emily O. Miller, and Frances C. Lawrence. 2008. "Rural Mothers' Use of Formal Programs and Informal Social Supports to Meet Family Food Needs: A Mixed Methods Study." *Journal of Family and Economic Issues* 29 (4): 674–90.

Ver Ploeg, Michele, Lisa Mancino, Jessica E. Todd, Dawn Marie Clay, and Benjamin Scharadin. 2015. "Where Do Americans Usually Shop for Food and How Do They Travel To Get There? Initial Findings from the National Household Food Acquisition and Purchase Survey."

Wimer, Christopher, Rachel Wright, and Kelley Fong. 2013. *The Cost of Free Assistance: Studying Nonuse of Food Assistance in San Francisco*. Institute for Research on Poverty, University of Wisconsin-Madison.

Winne, Mark. 2008. *Closing the Food Gap: Resetting the Table in the Land of Plenty*. Beacon Press.

Figure 1. Number of Free Meals Received from Family and Friends Versus Food Banks, Food Pantries and Places of Worship (Overall Sample)

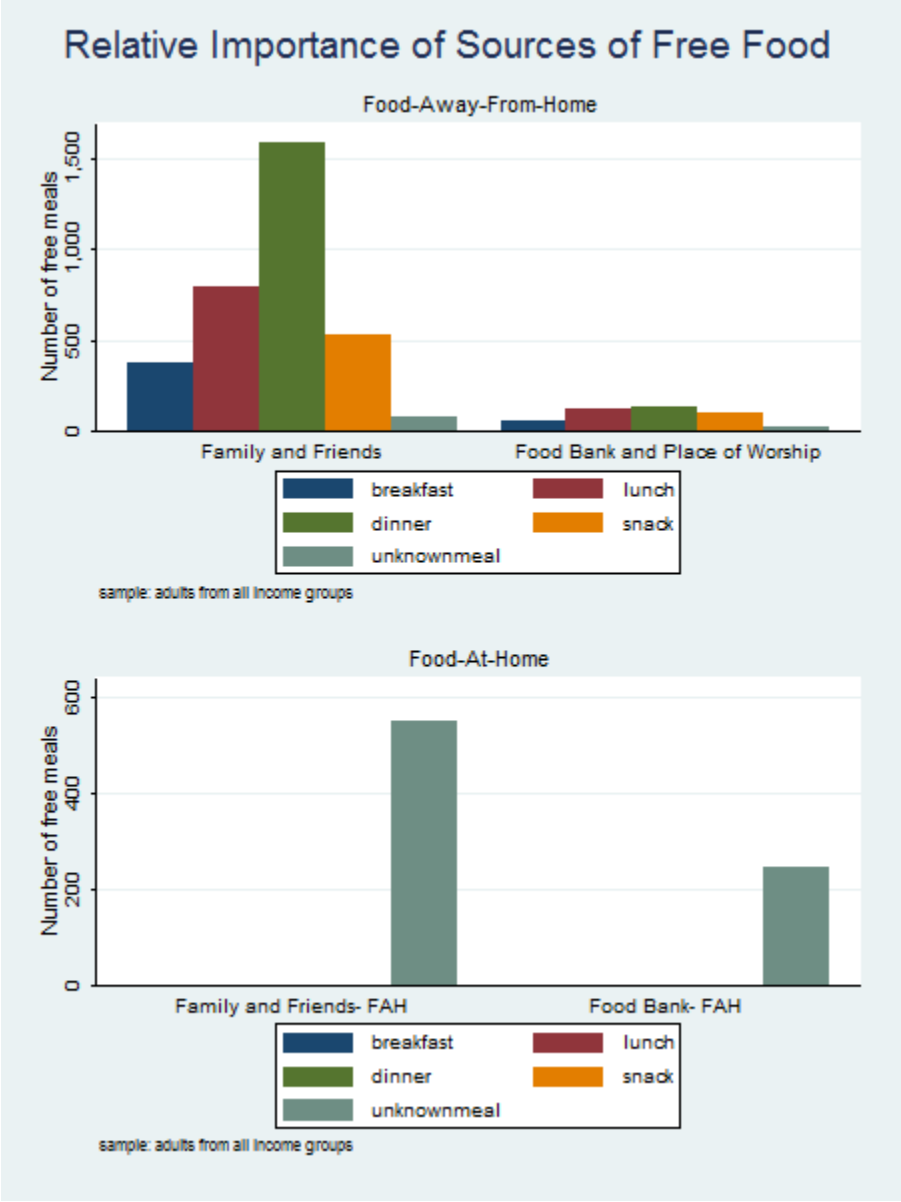

Figure 2. Number of Free Meals Received from Family and Friends Versus Food Banks, Food Pantries and Places of Worship (SNAP Participants)

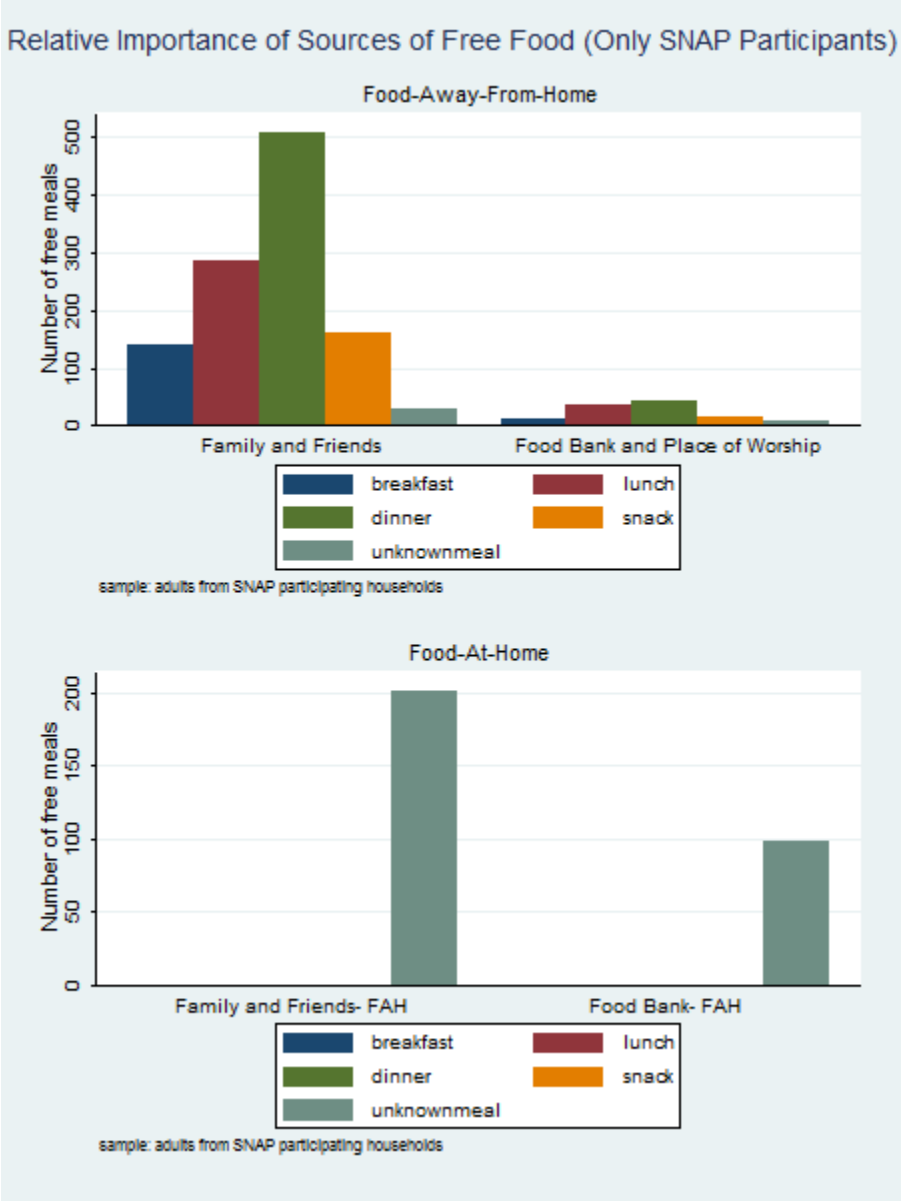

Table 1. Food Security Status across income groups and food sharing groups

	Overall	SNAP Participation income group				Food sharing	
		SNAP participants	Non-SNAP, income <= 100% FPL	Non-SNAP, income 101 - 185% FPL	Non-SNAP, income > 185% FPL	Households that received any meals	Households that gave out any meals
Number of Observations	4,826	1,581	438	882	1,925	1,226	1,256
Food Insecure (share)	0.16 (0.01)	0.44 (0.02)	0.39 (0.04)	0.25 (0.02)	0.06 (0.01)	0.16 (0.02)	0.15 (0.01)

Note: Weighted means reported; standard errors are in parentheses. Standard errors account for oversampling and the complex survey design of FoodAPS. Red text indicates estimates are different from relevant reference group (SNAP Participants) with p-value <= 0.10.

Table 2. Food Sharing Behavior Across Income Groups, and Food Security Status

	Overall	SNAP Participation income group				Food security Status	
		SNAP participants	Non-SNAP, income <= 100% FPL	Non-SNAP, income 101 - 185% FPL	Non-SNAP, income > 185% FPL	Food Insecure	Food Secure
Share of Households that received Any Free Meals	0.26	0.29	0.23	0.26	0.26	0.27	0.27
	(0.01)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.01)
-Number of received meals (conditional mean)	1.91	2.05	1.97	1.88	1.88	1.98	1.90
	(0.07)	(0.11)	(0.20)	(0.12)	(0.09)	(0.11)	(0.07)
Share of Households that Gave Out Food	0.27	0.25	0.26	0.24	0.27	0.25	0.27
	(0.01)	(0.02)	(0.04)	(0.03)	(0.02)	(0.02)	(0.01)
-Number of given meals (conditional mean)	2.93	2.74	2.91	2.95	2.96	2.88	2.94
	(0.14)	(0.25)	(0.51)	(0.21)	(0.18)	(0.28)	(0.16)

Note: Weighted means reported; standard errors are in parentheses. Standard errors account for oversampling and the complex survey design of FoodAPS. Red text indicates estimates are different from relevant reference group (SNAP Participants) with p-value <= 0.10.

Table 3. Food Sharing Behavior Across Income Groups, and Food Security Status

		SNAP Participation income group			
		SNAP participants	Non-SNAP, income <= 100% FPL	Non-SNAP, income 101 - 185% FPL	Non-SNAP, income > 185% FPL
Share of Households that received Any Free Meals	Food Secure	0.29	0.20	0.26	0.26
		(0.03)	(0.04)	(0.03)	(0.02)
	Food Insecure	0.30	0.26	0.25	0.24
		(0.02)	(0.05)	(0.05)	(0.05)
Share of Households that Gave Out Meals	Food Secure	0.25	0.25	0.25	0.28
		(0.02)	(0.04)	(0.03)	(0.02)
	Food Insecure	0.25	0.26	0.23	0.24
		(0.03)	(0.06)	(0.04)	(0.05)

Note: Weighted means reported; standard errors are in parentheses. Standard errors account for oversampling and the complex survey design of FoodAPS.

Table 4. Food Sharing Behavior Across Income Groups, and Food Security Status

		SNAP Participation income group			
		SNAP participants	Non-SNAP, income <= 100% FPL	Non-SNAP, income 101 - 185% FPL	Non-SNAP, income > 185% FPL
Number of Received Meals (Conditional mean)	Food Secure	2.04	1.84	1.81	1.9
		(0.14)	(0.27)	(0.16)	(0.09)
	Food Insecure	2.05	2.13	2.13	1.61
		(0.19)	(0.31)	(0.19)	(0.24)
Number of Given Meals (Conditional mean)	Food Secure	2.52	3.17	2.83	2.98
		(0.25)	(0.74)	(0.28)	(0.18)
	Food Insecure	3.02	2.52	3.34	2.59
		(0.47)	(0.41)	(0.83)	(0.46)

Note: Weighted means reported; standard errors are in parentheses. Standard errors account for oversampling and the complex survey design of FoodAPS.

Table 5. Number of Free Meals

VARIABLES	(1) Number of received meals	(2) Number of given meals
SNAP Participants		
-Food Insecurity	0.04	0.15
	(0.11)	(0.17)
Food Secure		
Non SNAP		
<=100 % FPL	-0.24**	0.23
	(0.12)	(0.25)
101-185 % FPL	-0.10	0.07
	(0.10)	(0.14)
>185 % FPL	-0.13	0.15
	(0.09)	(0.13)
Food Insecure		
Non SNAP		
<=100 % FPL	-0.06	-0.01
101-185 % FPL	-0.12	-0.01
>185 % FPL	-0.30***	-0.12
Observations	4,810	4,810
R-squared	0.04	0.03

Weighted by sampling weight. *** p<0.01, ** p<0.05, and * p<0.1.

Table 6. Food Insecurity

	(1)	(2)
VARIABLES	Food Insecurity	Food Insecurity
Type of free meals	Received meals	Given meals
Income groups		
Non SNAP		
<=100 % FPL	-0.07	-0.04
	(0.04)	(0.04)
101-185 % FPL	-0.16***	-0.16***
	(0.03)	(0.04)
>185 % FPL	-0.31***	-0.31***
	(0.03)	(0.03)
Number of free meals Across income groups (Compared with SNAP participants)		
Non SNAP		
<=100 % FPL	-0.04	-0.06
101-185 % FPL	-0.16***	-0.16***
>185 % FPL	-0.32***	-0.31***
Number of free meals Within income groups		
SNAP participants	0.01	0.01
	(0.02)	(0.01)
Non SNAP		
<=100 % FPL	0.03	-0.01
101-185 % FPL	0.01	-0.01
>185 % FPL	-0.01	-0.01
Observations	4,810	4,810
R-squared	0.208	0.208

Weighted by sampling weight. *** p<0.01, ** p<0.05, and * p<0.1.