

# 412 Food Rescue Helps: Evidence of improvements to food security and other outcomes of Food Rescue

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Our society suffers from serious, systemic problems related to food and nutrition. A shocking number of Americans are food insecure. Food security is defined by the United Nations as the state of having physical, social, and economic access to sufficient, safe, and nutritious food that meets dietary preferences and needs for a healthy, active life. According to the USDA, more than 35 million people in the United States, or about 11% of the population – including 13.6% of households with children -- are food insecure.

In a context in which many people lack access to sufficient, healthy food, Americans waste an astonishing amount of food. It is estimated that up to 35 - 40% of the food supply in the US is discarded, and that each American discards an average of 219 pounds of food each year. Some organizations make even higher estimates that each of us wastes a pound of food each day. Wasted food is unavailable to people who are food insecure, and furthermore, creates substantial environmental damage.

Finally, Americans suffer from high rates of diet-related chronic illnesses, including diabetes, heart disease, and certain cancers. Decades of research convincingly demonstrates that the healthiest diets, associated with substantially lowered health risks, consist of mostly fresh, unprocessed foods. These are the very foods that are most likely to be discarded, as they have shorter shelf lives and are more vulnerable to spoilage than are the highly processed foods that make up so much of the American diet.

Clearly, these problems are related. Much of the food that is discarded is edible and could provide for people in need. Discarded food is likely to be fresh and if it could be redistributed it could improve the diet of people in need, who often must rely on inexpensive, highly processed foods, with their long shelf lives. Consuming rather than discarding food could prevent environmental damage.

Food gleaning organizations have stepped into this gap. Food gleaning organizations concentrate on collecting food and distributing food that is slated for discard, which reduces food waste. Food gleaning complements and augments other well-established strategies for distributing food to people in need, such as food banks and government voucher programs by targeting food slated for discard, which reduces waste, and may increase the amount of fresh food in the diet. Gleaned food is often fresh and unprocessed and can thus contribute to the healthfulness of the diets of people who receive it. Distributing this food to people in need could reduce food insecurity in our communities.

Food gleaning organizations face unique operational challenges. Donations of fresh foods nearing their spoilage dates are inherently unpredictable. There are many sources of fresh food slated for discard; these include grocery stores, grocery distributors, restaurants, delis, gas stations, and many other types of purveyors. Fresh food must be distributed quickly. Food gleaning organizations might be asked to collect anything from two sandwich rings to forty pallets of

cabbage. Techniques for identifying sources of food, destinations for food, and transportation between donors are recipients requires a complex operational system that is quite different from those used by food banks.

There are numerous potential benefits from food gleaning. Gleaned food could reduce food insecurity. It may improve the healthfulness of the diet because it focuses on rescuing and redistributing high-quality, fresh, unprocessed, or lightly processed foods. Reduction of waste could reduce environmental damage.

There are also potential barriers to these benefits. To reap the benefits, the food must be consumed, not just redistributed. If recipients are not satisfied with the quality or types of the food or cannot use it because it arrives in impractical amounts or they do not know how to prepare it, rescued food will still be wasted.

Despite their numerous potential benefits, efforts to document outcomes for food re-distribution are uncommon. Standardized instruments to measure the effects of food redistribution are lacking.

This work reports on efforts made by a high functioning food gleaning organization to establish techniques to measure outcomes, and to document the outcomes of their work.

**AGENCY CONTEXT** 412 Food Rescue is a high functioning food gleaning organization based in Pittsburgh Pennsylvania. 412 Food Rescue has developed a set of sophisticated, technology-supported procedures to identify, collect, and distribute food.

412 Food Rescue is committed to advance techniques to measure the effectiveness of food redistribution organizations, and to document the results of their own work. The agency worked with an experienced academic partner to identify measurable constructs and develop valid and usable measurement tools. The development of the tools is described in an Appendix. The agency now uses these tools regularly to track the effectiveness of their efforts.

## METHODS

**LOCATIONS, PARTICIPANTS, AND PROCEDURES** 412 Food Rescue works with the Allegheny County Housing Authority to deliver food directly to public housing sites. About twenty sites receive regular deliveries. This is one of a large number of distribution strategies used by 412 Food Rescue. 412 Food Rescue organizes regular food deliveries to these sites. These sites have stable communities with regular access to 412 Food Rescue donations of gleaned food.

Two waves of data collection have been completed. During each wave, staff from 412 Food Rescue were trained to collect surveys during regular food distribution events. Sites were scheduled with the permission of the resident volunteer responsible for coordinating food distribution. All individuals collecting food were informed of the opportunity to complete the survey. The staff member announced that the purpose of the survey was to learn if food deliveries were working for them, that participation was voluntary and did not affect their eligibility to pick up food, that they could skip all of it or any part of it that they did not like, and that surveys were anonymous, as no identifying information of any kind was collected. This was also explained in writing on a front page of the survey.

In Wave 1, surveys were distributed from 12/14/2017 to 2/9/2018. 311 people from 22 sites completed surveys.

In Wave 2, surveys were distributed from 12/12/2019 to 2/12/2020. 191 people from 16 sites participated.

**MEASURES** 412 Food Rescue participated in a process to identify constructs that captured benefits of food rescue and potential barriers, and then to develop items and item-responses that captured these constructs. Stakeholders and food recipients were interviewed to identify key constructs, items and item-responses were drafted, and cognitive interviews were conducted to ensure they were clear and understandable. The final questionnaire included five items from the USDA Food Insecurity short form questionnaire, with modified response items, along with seven

indicators of five outcomes, four indicators of potential barriers to food use. These are described below.

**FOOD SECURITY** Food security is an essential outcome, and the USDA publishes measures of food security. The USDA questionnaire is designed to capture a population characteristic, not individual change, so item responses were adapted to that the items could be used after food deliveries were already established, and so that they captured participants' perceptions of change.

Five items from the USDA short-form Food Insecurity questionnaire were used; these include: "The food I bought just didn't last, and I didn't have money to buy more", "I couldn't afford to eat balanced meals", "I have cut the size of my meals or skipped meals because there wasn't enough money for food", "I ate less than I felt I should because there wasn't enough money for food" and "I was hungry but didn't eat because there wasn't enough money for food". (The USDA short-form includes a sixth question, which asks how frequently the respondent had to cut the size of meals or skip meals.)

Participants reported, for each indicator, whether food deliveries from 412 Food Rescue "help a lot", "help a little", "make no difference" or "make this worse". Each item is scored 1 if food deliveries help a little or a lot, 0 if they make no difference, and -1 if they made the indicator worse.

Participants are included in the analysis if they answered one or more of the food security indicator questions. First, the number and percent of individuals who never experienced any food insecurity indicators is reported. Then, scores for participants who experienced any food insecurity items are summed, and categorized. Participants with positive scores are considered "improved", and those with negative scores are considered "worsened".

Food rescue outcomes and barriers. Outcomes and barriers are worded as statements, for example "I use nearly all of the food provided by 412 Food Rescue". Response items include "strongly

agree", "agree", "disagree", and "strongly disagree".

**OUTCOMES** Seven statements measuring five potential positive outcomes of receiving rescued food were measured. Importantly, food rescue cannot be successful if the food is not consumed, and this is listed as its own domain. Other potential outcomes included improved quality of diet, financial relief, reduced stress, and improved connection with community. Domains are shown in the Results Table. The questionnaire is provided as an Appendix.

**BARRIERS** The benefits of food rescue can only be realized if people eat the food. Barriers to consuming the food were identified and included in the survey. These include satisfaction with the quality and types of food, willingness to try unfamiliar foods, and ability to learn to prepare the food, if necessary.

Results for items are reported separately. The number and percent of individuals who answered the question, who agreed or strongly agreed is reported.

**RESULTS** Food insecurity. In 2018, 291 individuals responded to one or more of the five questions asking whether receiving rescued food helped them, made their situation worse, or made no difference.

15 people responded that they had never experienced any of the food insecurity indicators.

In 2020, 190 individuals answered Food Insecurity items. 18 people (9.5%) reported they had never experienced any food insecurity indicator.

	2018 (N=291)	2020 (N=172)
Improved	264 (90.7%)	154 (89.5%)
Stayed the same	23 (7.9%)	15 (8.7%)
Worsened	4 (1.4%)	3 (1.5%)

Food use, outcomes, and barriers. The number of people responding to the question, and the percent of people who agreed or strongly agreed with the statement, is tabulated.

	N	2018	N	2020 (N=191)
<b>FOOD USE</b>				
<i>I use nearly all the food</i>	311	275 (88.4%)	190	170 (89.5%)
<b>OUTCOMES</b>				
<i>I eat healthier food</i>	309	268 (86.7%)	188	156 (83.0%)
<i>I have more choices about types of food</i>	307	270 (87.9%)	191	169 (88.5%)
<i>Helps make ends meet</i>	310	285 (91.9%)	190	175 (92.1%)
<i>I can put money elsewhere</i>	304	259 (85.2%)	190	163 (85.8%)
<i>I am more connected with my community</i>	299	242 (80.9%)	186	150 (80.6%)
<i>I am less stressed</i>	259	198 (76.4%)	190	156 (82.1%)
<b>POTENTIAL BARRIERS</b>				
<i>I am satisfied with the food</i>	306	281 (91.8%)	190	170 (89.5%)
<i>I am satisfied with the variety of food</i>	311	276 (88.7%)	191	166 (86.9%)
<i>I will try unfamiliar foods</i>	311	274 (88.1%)	190	153 (80.5%)
<i>It is easy to find out how to prepare the food</i>	309	285 (92.2%)	186	165 (88.7%)

**DISCUSSION** Food rescue focuses on identifying usable food and redistributing it to people in need. It has the potential to provide for people's needs with the high-quality fresh foods that constitute the most healthful diet, and to reduce food waste. Food waste has substantial, negative, environmental impact.

Despite the importance and potential benefits of food rescue activities, there have been few efforts to document outcomes, or barriers to the potential, positive outcomes. In part, this is due to the lack of measurement tools that can be used effectively by social service agencies.

Social service agencies need to focus on providing services, and must be mindful of costs of data collection. We elected to develop a short instrument that could be used after food deliveries have been established, focusing on the most important constructs that could capture outcomes

and barriers. The items identified can also serve as quality assurance for food gleaning organizations.

412 Food Rescue has established regular data collection to gain information on the effectiveness of their activities. Approximately 500 people who receive food have returned surveys reporting on their perceptions regarding changes to indicators of food security, other outcomes of food rescue, and potential barriers to food rescue.

Responses are overwhelmingly positive. Approximately 90% of individuals who experienced any indicators of food insecurity report that they improve with food deliveries. Nearly 90% of individuals report that they use all or nearly all of the food provided, suggesting that food waste is not a substantial problem. 85-90% of individuals report improvements to their diet, and financial relief. More than 75% of people report reduced stress, and greater connections with their communities, that they attribute to receive rescued food.

Barriers do not appear to pose problems. Between 80% and 92% of individuals report that they are satisfied with the food, will try unfamiliar food, and can easily prepare the food.

In many ways, these results are to be expected. 412 Food Rescue delivers high quality food to sites where it can be conveniently collected by people who have many stressors, and few resources. However, tools to document these positive effects have not been available, and results documenting positive effects have been few. This work moves the field forward by establishing useful measurement tools, and, most importantly, clearly documenting the high value of the activities of 412 Food Rescue.