

# Using Food Waste from Local Farmers to Improve Food Access for the Food Insecure

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## Abstract

The objective of this study is to determine if local farmers produce a substantial amount of safe-to-eat, excess food; to assess if these local farmers have a means to distribute excess food to food insecure individuals within the community, and whether local farmers have an interest in participating in a distribution system to delivery excess food/food waste (if they are not already). Participants selected for this study were recruited from across Louisiana, the target population was farmers that own/operate “small-scale” farms. A non-experimental descriptive study using a mixed-methods survey, was conducted to determine the status food waste among farmers and farmer interest in participating in distribution of excess food to food insecure individuals. The sample size was N=13. The results revealed: (a) small local farms often may not produce a significant amount of excess food; (b) local farmers blame inadequate demand, marketing, or distribution issues most often for any food waste occurrences; (c) approximately half of local farmers already distribute excess food to those in needs; (d) approximately half of local farmers are interested in implementing some type of excess food re-distribution system in which food would be picked up from their farm and delivered to food insecure individuals; and (e) most local farmers would not be willing to put in extra time for food distribution. More research relating to farmers’ thoughts and behaviors regarding food loss is needed, along with education for local farmers regarding the importance of food security for their local communities.

## Introduction

### Food Insecurity

- Food insecurity is an important public health issue that is associated with poor accessibility to fresh, diverse, and affordable food products (Lebel et al., 2016). Adequate nutrition is fundamental from infancy through adulthood and is one of the most important determinants of health. In 2010, almost forty-nine million Americans lived in food-insecure households (Evans & Nagele, 2018).
- Food insecurity afflicts many people and disproportionately affects the Global South but developed countries (including the United States) are not protected from the issues of food insecurity (Moore, 2017).
- Roughly a quarter of the United States (U.S.) population participates in some form of public nutrition assistance program aimed at alleviating food insecurity. These include programs such as the Supplemental Nutrition Assistance Program (SNAP), Women Infants and Children (WIC), or school meal programs (Leonard et al., 2018). Moreover, there is evidence suggesting that a large proportion of households receiving food assistance may experience micronutrient malnutrition due to inadequate diets due to insufficient consumption of micronutrient-rich foods such as fruits and vegetables (Lee et al., 2017).

### Food Waste

- Another pervasive problem in the U.S. is food waste. Americans produce ninety-six billion pounds of food waste annually, and most of it cannot be justified. Additionally, 31% percent of the food grown, produced, and transported in the U.S. is wasted annually (Evans & Nagele, 2018).
- Currently, of the food waste attributed from the manufacturing sector, only about 1.6% is recovered for human consumption through donation. Sixty-nine percent is re-directed for animal feeding, 26% is recycled through land application, composting, etc., and the remaining 5.4% is disposed of in landfills or by incineration (Dou et al., 2016).
- While food waste is a growing problem, food redistribution efforts have also grown immensely due to the rise of several food bank and food rescue organizations, and these organizations collect excess food and distribute it to welfare agencies that feed people in need (Vlaholias et al., 2015).

### The Paradox

- It seems paradoxical that food insecurity and food waste can concurrently be systemic problems, especially in a high-income country like the U.S. (Lee et al., 2017). These two issues of food insecurity and food waste may not seem directly related but taking a closer look at the underlying causes of these issues reveals that they have much more in common than one might think initially.
- The two problems are similar in that the root causes of food insecurity and food waste here in the U.S. relate back to systemic inefficiencies. An example of such inefficiencies contributing to food insecurity is structural racism and discrimination.
- For over 20 years, food insecurity has been assessed and monitored by the USDA at the federal level, and although levels of food insecurity have both declined and risen over this period, one trend that has continued to persist is the gap in the prevalence of food insecurity between people of color and whites (Odoms-Young & Bruce, 2018)

## Introduction Cont.

### Study Importance

- This study is important because of the existing high rates of both food waste and food insecurity (Evans & Nagele, 2018). This study will explore the extent of food waste at the farming level and how currently wasted food from farms, that is still safe-to-eat, can be re-routed to reduce food insecurity.

### Study Purpose and Objectives

- The purpose of this study is to determine if local farmers have a feasible way to distribute excess food to food insecure individuals within their community.
- The objective of this study is to determine if local farmers: (a) produce a substantial amount of safe-to-eat, excess food; (b) assess if local farmers have a means to distribute excess food to food insecure individuals within the community; and (c) determine if local farmers have an interest in participating in a distribution system to delivery excess food/food waste (if they are not already).

## Materials & Methods

### Participants

Participants were recruited using the Louisiana Farm Food Map and Directory which was developed in 2019 by the Louisiana State University, College of Agriculture department. This is an open-source directory. No permission is required for use. Participants selected for this study are found across Louisiana that are considered “small-scale” farms. The United States Department of Agriculture (USDA) defines a small farm as an operation with gross cash farm income under \$250,000. Despite the continuing shift in production to larger farms (defined as more than \$250,000 in gross farm income), the contribution of small commercial family farms is still considerable, and they numbered about 800,000 of the 2.2 million U.S. farms in 2007 (USDA, 2021). The sample (N=18) was recruited via email communication. Emails were sent to 145 farms located across Louisiana. This 12.4% response rate was substantially lower than the desired sample size.

### Methods

A non-experimental descriptive study, using a mixed-methods survey, was conducted to determine the status of food waste among farmers and farmer interest in participating in distribution of excess food to food-insecure individuals. Survey research can use quantitative research strategies (e.g., using questionnaires with numerically rated items), qualitative research strategies (e.g., using open-ended questions), or both strategies (i.e., mixed methods) since they are often used to describe and explore human behavior, surveys are therefore frequently used in social and psychological research (Ponto, 2015).

### Data Collection and Procedures

Data was collected using SurveyMonkey. The survey addressed three main questions: (1) Do local farmers produce a significant amount of food waste that is safe to eat? (2) How do local farmers typically identify and deal with excess food or “ugly food”? (3) Are local farmers open to utilizing a delivery system which would make distribution of excess food and/or food waste easier? An email, with an introduction explaining the purpose of the survey, the implied consent, and the survey link, was sent to the accessible population (Appendix D). The survey was open for a 30-day period. Email reminders were sent out four times during the open survey period to encourage participation and thank you emails were sent to every participant after completion of the survey. Participation was voluntary.

### Data Analysis

Data analysis was conducted using the IBM® program SPSS® version 28.0.0.0. Descriptive statistics were used in the data analysis of this study. Descriptive statistics represent the mathematical conventions for organizing and summarizing raw data. The raw data was organized and tabulated as a frequency distribution. The raw data from SurveyMonkey® was exported as an Excel file which was compatible with SPSS®. This Excel file was then imported to the SPSS® program.

## Results

### Demographics

- All 13 participants answered affirmatively the question which asked, “Are you currently a farmer who produces fruits and/or vegetables?” Additionally, each reported that they currently reside in Louisiana and were 18 years or older at the time of the study. Of the 13 usable responses, all reported that their farm’s cash gross income was \$249,999 or less (meeting definition of a “small farm”) and zero (0.0%) reported \$250,000 or more of cash gross income.

## Results Cont.

### Food Waste Prevalence

Table 1

Pounds of Food per Week Produced by Farms with an Annual Gross Income of <\$249,000		
	N	%
<99 pounds	2	15.4%
>90 pounds	4	30.8%
100-299 pounds	6	46.2%
None of the above	1	7.7%

Table 3

Most Common Stage of Process at Which Food Waste Occurs on Local Farms		
	N	%
Post-distribution	5	38.5%
Post-harvest	3	23.1%
Pre-harvest	2	15.4%
Time of harvest	3	23.1%

Table 2

Pounds of Food per Week Wasted by Farms with an Annual Gross Income of <\$249,000		
	N	%
>50 pounds	2	15.4%
0 pounds	2	15.4%
1-9 pounds	5	38.5%
10-29 pounds	4	30.8%

Table 4

Foods Most Commonly Wasted at Local Farms		
	N	%
Fruits (melons, pomes, berries, tropical/sub-tropical, etc.)	4	30.8%
Herbs	1	7.7%
Leafy vegetable crops (flowers, stems, leafy greens, etc.)	6	46.2%
Other (please specify)	1	7.7%
Seeded vegetables (Cucurbit/fining, Solanaceous, Legumes, etc.)	1	7.7%

- When asked to rank how excess food is most commonly handled at their farm in order of usage, three (23.1%) reported “Animal Feed” as most used, four (30.8%) reported “Thrown Away” as second most, seven (53.8%) reported “Given Away (at market to customers, family, friends, etc.)” as third most used, two (15.4%) reported that “Land application, composting, etc.” were fourth most used, four (30.8%) reported “Preserved” as fifth most used, and four (30.8%) reported “Donated to food bank or soup kitchen” as sixth most used.
- When asked to rank in order of usage, how the participants determine if a food is not good enough to sell, six (46.2%) ranked “Food safety guidelines” as most used, four (30.8%) ranked “When discoloration or odor arises” as second most used, seven (53.8%) ranked “How long it has been stored” was commonly as third most used, and four (30.8%) ranked “How long it has been since harvest” as least used. When asked how much food (in pounds) is deemed “not good enough to sell” each week, one (7.7%) reported >50 pounds, one (7.7%) reported 30-49 pounds, five (38.5%) reported 10-29 pounds, five (38.5%) reported 1-9 pounds, and one (7.7%) reported 0 pounds.

Table 5

Pounds per Week of Foods Deemed “Not Good Enough to Sell” by Local Farmers		
	N	%
>50 pounds	1	7.7%
0 pounds	1	7.7%
1-9 pounds	5	38.5%
10-29 pounds	5	38.5%
30-49 pounds	1	7.7%

Table 6

Pounds per Week of Foods Deemed “Not Good Enough to Eat” by Local Farmers		
	N	%
0 pounds	2	15.4%
1-9 pounds	7	53.8%
10-29 pounds	2	15.4%
30-49 pounds	1	7.7%

### Feasibility of Food Pick-Up System

Table 7

Farms Who Currently Distribute Excess Food to Those in Need		
	N	%
No	6	46.2%
Yes	7	53.8%

Table 8

Where Local Farmers Currently Distribute Excess Food		
	N	%
Directly to individuals	5	38.5%
Farmer’s market	1	7.7%
Food bank/soup kitchen	2	15.4%
It stays on farm	3	23.1%
Other (please specify)	1	7.7%

Table 9

Local Farmer Interest in an Expedited Food Pick-up Service		
	N	%
Agree	6	46.2%
Disagree	2	15.4%
Neither agree nor disagree	3	23.1%
Strongly agree	1	7.7%
Strongly disagree	1	7.7%

Table 10

Amount of Time that Local Farmers Would be Willing to Dedicate to Participate in Food Pick-up Service		
	N	%
0 hours	6	46.2%
1 hour	2	15.4%
2-4 hours	4	30.8%
5-9 hours	1	7.7%

- When asked what system is utilized to distribute any excess food, four (30.8%) reported “Employees of farm distribute food to a food bank or non-profit,” zero (0.00%) reported “A food bank picks it up,” zero (0.00%) reported “A non-profit picks it up,” three (23.1%) reported “Individuals travel to the farm to glean or collect,” five (38.5%) reported “No distribution occurs,” and one (7.7%) reported “Other (please specify).” The “Other (please specify) answer was: “Deliver or pick up while in town.”
- When asked to rank in order of significance, the barriers that the farms may face when trying to store excess food in a safe way, four (30.8%) ranked “Inadequate cold storage space” as most significant, four (30.8%) ranked “Inadequate dry storage space” as second most significant, four (30.8%) ranked “Inadequate amount of storage containers” as third most significant, five (38.5%) ranked “Labor hours” as fourth most significant, and seven (53.8%) ranked “Staffing issues” as least significant.

## Conclusion

The results presented in this study demonstrate (a) small local farms often may not produce a substantial amount of excess food; (b) local farmers blame inadequate demand, marketing, or distribution issues most often for any food waste occurrences; (c) approximately half of local farmers already distribute excess food to those in need; (d) approximately half of local farmers are interested in implementing some type of excess food re-distribution system in which food would be picked up from their farm and delivered to food insecure individuals; and (e) most local farmers would not be willing to put in extra time for this project so the distribution system would have to be hassle-free for the farmers.

This study is relevant to both nutritional sciences and horticultural sciences. The findings of this study are important for many reasons, with the main reason being the lack of existing research surrounding the topic of local farm food waste and re-distribution efforts. It also has important implications for local farms in Louisiana and solidifies the need for future studies to better understand farmers’ thoughts and behaviors surrounding excess food and food loss. There may be a lack of knowledge of the importance of food security and seriousness of food insecurity for the health of the community’s those local farmers serve. Education surrounding this issue could potentially be carried out by community RDs.

### Limitations & Recommendations

Limitations of the study include characteristics of design or methodology that impact or influence the interpretation of the findings but are beyond the researcher’s control (Price & Murnan, 2004). For this study, the primary limitation was the sample size, which may limit the utility of the data obtained.

### Recommendations:

- It is recommended that a food distribution system be established along with future studies looking at ways to help farmers extend the shelf-life of vegetables. The results of this study indicate that storage issues are one of the main reasons for food going to waste. Therefore, assessing ways in which organizations/non-profits could donate storage containers or funds to expand dry and cold storage space could be beneficial for local farmers and the future of our food system and communities.
- There may be a gap in knowledge among local farmers and how best to help food insecure individuals within their community, as well as a gap in knowledge regarding the importance of food security and the other social determinants of health. Community Registered Dietitians (RDs) could be of help regarding education and outreach efforts.
- More RD engagement surrounding policy and advocacy related to the food system is recommended so that RDs can better support and voice concerns for local farmers to legislators.
- Coordinated research efforts to identify specific crops with high loss percentages that are also of high utility to food banks would also be of great value.
- Expand on research topic to more fully determine small-scale farmers’/operators’ thoughts and behaviors about food waste and gain their perspective on the best solutions, rather than providing them with one option such as the on-farm food waste re-distribution looked at in this study.

## Survey

## References

