Evaluating the Effectiveness of the "Save More Than Food" Campaign in Changing Food Waste Awareness and Behaviors in Upper Arlington, Ohio Households*

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Abstract

Communities are increasingly interested in bolstering sustainability by implementing local campaigns to reduce wasted food and divert it from landfills. This report documents the evaluation of the effectiveness of the "Save More Than Food" campaign as implemented in the community of Upper Arlington, Ohio, during the spring of 2021. The campaign used multiple channels to provide information on food waste prevention and diversion to local residents. Evaluation can be challenging, however, as community-engaged interventions may reach all community members, making it difficult to find an appropriate control group. We leverage a recently validated online survey instrument with samples from both the treated community and from the United States at large to provide an additional mode for assessing efficacy. We find that the amount of wasted food reported by Upper Arlington households declined by 23% after the local campaign implementation while the national sample reported a 29% increase in wasted food over the same period with the 52% net difference between these trends being statistically significant. A contemporaneous curbside audit of Upper Arlington households revealed a 17% reduction in wasted food and a 30% reduction in inedible food scraps where only the latter pre/post campaign reduction was statistically significant and no parallel national curbside audit data was available. We also assess the campaign's effect on resident awareness, attitudes, and composting behaviors. These results suggest that the Save More Than Food campaign can be an effective tool for reducing household food waste and diverting wasted food from landfills through increased community composting activity, particularly when the campaign is deployed through trusted community actors and their communications channels. The report ends with several recommendations applicable to communities considering campaign implementation, policy makers that can encourage campaign development and deployment, and researchers that evaluate food waste reduction interventions.

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* Corresponding author: roe.30@osu.edu. The authors recognize funding from a 2020 Sustainable Materials Management Grant provided by the U.S. Environmental Protection Agency - Region 5. Roe recognizes support from the Van Buren program and from USDA-NIFA (#OHO01419). The authors thank the study participants and the City of Upper Arlington for their support of this study.

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Executive Summary

Every day, Central Ohio households contribute a million pounds of food to landfills, resulting in the waste of key natural resources used to produce food while also contributing significantly to greenhouse gas production. This realization motivated the Solid Waste Authority of Central Ohio (SWACO) and dozens of Central Ohio organizations to join forces in 2018 to identify a shared set of strategies for cutting food waste in half in the region by 2030, including the creation of the **Save More Than Food** (SMTF) campaign, which uses public outreach channels to provide information on food waste prevention and diversion.

To better understand how the SMTF campaign impacts residential food waste and how to guide communities on effective implementation of the campaign, SWACO sought and received funding from the U.S. Environmental Protection Agency to partner with the City of Upper Arlington and the Ohio State University (OSU) to study how food waste awareness, attitudes, knowledge, and volumes changed after implementing the SMTF campaign in Upper Arlington during the spring of 2021. To evaluate campaign effectiveness, household food waste was measured before and after sharing SMTF campaign materials with Upper Arlington residents. Food waste was measured through self-reports gathered via survey and through physical assessment of household waste collected curbside; the survey also measured respondent awareness, attitudes, and knowledge about food waste. To adjust for factors besides the campaign that could affect food waste (e.g., seasonal trends), the difference over time for those households known to receive the full complement of SMTF campaign materials was contrasted against the difference over time from two control groups: Upper Arlington households that received fewer SMTF campaign materials and households surveyed from around the United States who received no SMTF materials.

The SMTF campaign led to a 23% reduction in the amount of wasted food reported by Upper Arlington respondents compared to a 29% increase reported by the national control group during the same period, representing a statistically significant 52% net reduction in food waste generation attributable to the campaign. The curbside audit of household food waste revealed a statistically insignificant 21% reduction in overall food waste and a significant 30% reduction in inedible food scraps going to the landfill after campaign implementation, though these reductions were unrelated to the differential exposure to SMTF campaign materials across Upper Arlington treatment groups. Participation in Upper Arlington's drop-off food waste composting program also increased by about 40% soon after the Spring 2021 launch of the SMTF campaign.

Awareness about the SMTF campaign increased significantly over the course of the campaign in Upper Arlington (6.5% before, 41.8% after). Of Upper Arlington respondents who recalled seeing the SMTF campaign, 57% found it to be effective in driving awareness of food waste as a topic with respondents from neighborhoods that received all SMTF campaign materials reporting a greater increase in perceived effectiveness than respondents from neighborhoods receiving fewer campaign materials. In contrast, Upper Arlington survey respondents reported

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little change in their attitudes towards food waste, their knowledge about food waste prevention and composting, or their household actions that typically support reductions in food waste. The exception was that self-reported composting activity did increase after campaign implementation, though this was unrelated to the differential exposure to SMTF campaign materials across neighborhoods. Survey responses also suggest that future increases in composting participation in Upper Arlington could follow several different paths each entailing distinct financial and logistical costs (e.g., more community drop sites, curbside-side composting, etc.), though simple information provision is unlikely to be sufficient.

These results suggest that a community-based implementation of the SMTF campaign can be an effective tool for reducing household food waste and diverting wasted food from landfills through increased community composting activity, particularly when the campaign is deployed through trusted community actors and their communications channels. Analyses of the Upper Arlington survey results suggest several promising pathways for ensuring an effective community implementation of SMTF including focusing household food waste reduction strategies on fresh produce, which is the dominant source of waste in Upper Arlington and in most studies of household food waste, and ensuring that the local composting infrastructure is prepared to handle increases in composting interest and activity prior to campaign deployment. The report ends with several recommendations applicable to communities considering campaign implementation, policy makers that can encourage campaign development and deployment, and researchers that evaluate food waste reduction interventions.

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1. Introduction

1.1. Background

Every day more than one million pounds of food finds its way into the landfill in Central Ohio. This amounts to 15 percent of all landfilled waste in the region by weight, according to a 2019 waste characterization study conducted by the Solid Waste Authority of Central Ohio (SWACO 2019). This food not only takes up space in the landfill, but wastes key resources used to produce it while also contributing significantly to methane production, a potent climate change inducing greenhouse gas.

While businesses and institutions are significant contributors to this waste, roughly half of it comes from households. This realization motivated SWACO and dozens of Central Ohio organizations participating in the Central Ohio Food Waste Initiative (COFWI) to join forces in 2018 to identify a shared set of strategies for cutting food waste in half in the region by 2030. These strategies and accompanying action items became the Central Ohio Food Waste Action Plan.

Central to COFWI's ongoing efforts is the **Save More Than Food** campaign. Launched in September 2020, Save More Than Food (SMTF) and its website (savemorethanfood.org) provide Central Ohio residents, schools, and businesses with resources, information, and strategies for reducing food waste. Informed by input from 17 COFWI partner organizations, surveys of Central Ohio residents, and national best practices for food waste public awareness campaigns, Save More Than Food uses a variety of public outreach channels to provide information on food waste prevention and diversion. However, little is known about the impact that this messaging has on food waste behaviors among residents.

To better understand how the campaign impacts resident food waste behavior, SWACO partnered with the City of Upper Arlington and Ohio State University (OSU) to study how food waste volumes changed in Upper Arlington after implementation of specific SMTF campaign messaging efforts during the spring of 2021. This work was supported by a $60,000 grant from the U.S. Environmental Protection Agency (EPA). The goal of the research was to better understand the effectiveness of campaign outreach tools to improve consumer attitudes, knowledge, and behavior regarding food waste. These insights will help guide other communities on how to reduce and divert residential food waste.

1.2. Partners

1.2.1. SWACO

SWACO serves as a trusted source of expertise and leadership for the Central Ohio region on a wide range of waste diversion topics. SWACO has a proven track record of progressing results-driven work that diverts waste from landfills and contributes to SWACO's goal to help Franklin County reach 75% diversion by 2032. Starting in 2018, SWACO has led COFWI partners in the development of the Central Ohio Food Waste Action Plan and coordinates the implementation of the Save More Than Food campaign.

1.2.2. The Ohio State University

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OSU research partners included Dr. Brian Roe and doctoral candidate Yiheng Shu. Dr. Roe is the Van Buren Professor in the Department of Agricultural, Environmental and Development Economics at OSU and leads the Ohio State Food Waste Collaborative. Dr. Roe has served as the principal investigator or co-investigator on federally funded projects totally more than $25 million of funding during his career, including a USDA funding focused on developing a novel evaluation method to test for the effectiveness of nudges to reduce household food waste (USDA grant 2017-6702326268) and co-directing a National Science Foundation Research Network focused on increasing food system sustainability and equity by reducing wasted food (NSF grant 2115405, wastedfood.american.edu).

1.2.3. City of Upper Arlington

Upper Arlington is located northwest of the City of Columbus within SWACO's waste management district. With a population of approximately 35,000 residents and 13,500 single-family households, Upper Arlington is the fourth largest of the 41 communities within SWACO's jurisdiction. The city has been a significant contributor to SWACO's food waste reduction and diversion goals. In addition to helping to deploy Save More Than Food campaign materials, Upper Arlington currently operates three food waste drop-off locations that diverted 408,000 pounds of food from the county landfill since the implementation of their program in May 2019.

1.2.4. GT Environmental

GT Environmental is a local environmental research and consulting firm. They worked with the main project team to conduct baseline and evaluation waste audits in Upper Arlington. This work involved collecting and sorting household and route-level waste and compiling and organizing that audit data.

1.2.5. Local Waste

Local Waste is a solid waste hauling company that serves the City of Upper Arlington. Local Waste worked with the project team to identify three neighborhood areas for the control and test areas and communicate waste audit information and instructions to route drivers.

1.3. Goals

The goal of the research partnership was to evaluate the effectiveness of the Save More Than Food campaign materials in raising resident food waste awareness, increasing their knowledge of how to make changes in their own lives, and taking action to reduce food waste at home. Better understanding of how and to what extent educational and awareness materials impacted resident awareness and activity provides an important starting place for further refining and improving food waste reduction and diversion campaigns, not only in Central Ohio, but across the rest of the state and nation. Learnings from the project will contribute to new programs and resources that will assist Central Ohio communities with combating wasted food.

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2. Approach and Methods

2.1. Study Design

The design chosen to evaluate campaign effectiveness is a comparison of household food waste and food waste attitudes, knowledge and precursor actions measured before and after the provision of intensive SMTF campaign materials to select neighborhoods in Upper Arlington. We employ several strategies to ensure this design provides a robust evaluation of campaign effectiveness.

2.1.1. Strategy

Studies that rely upon measuring differences in behavior before and after the implementation of a particular treatment face a key assessment challenge, namely there may be other uncontrolled factors that occur simultaneously with the treatment that also affect the measured behavior. To adjust for such factors (e.g., seasonal and secular trends that could alter household food waste), we employ a difference in differences measurement strategy. That is, we contrast the difference over time for those households known to receive the intensive campaign materials with a control group. For this study we use two control groups.

The first control group consists of households in Upper Arlington that did not directly receive the full suite of campaign materials. The research team divided Upper Arlington into three distinct areas for the purposes of this research. The areas chosen are based upon refuse hauling routes with households in each treatment area having their garbage collected on the same day; the control groups were the remaining areas.

Because these households are spatially adjacent to those neighborhoods that received the intensive campaign materials and received some campaign materials via other means (local social media accounts, websites, etc.), we also collect data on food waste from a sample of households recruited from a panel of online participants maintained by a commercial vendor who reside throughout the continental United States (detailed below).

Table 2.1.1 provides a timeline of the study depicting when each group received various campaign materials, when baseline and follow up measurements were collected, and how many participated from each group.

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Table 2.1.1. Timeline for Study Communications and Data Collection

Period	**Activity**	**National Control*** No targeted exposure to SMTF	**UA-Control** Generalized exposure to SMTF	**UA-FS** Intensive SMTF Materials (food storage only)	**UA-FS+C** Intensive SMTF Materials (food storage + compost)
Sep. 2020	SMTF Central Ohio Media Campaign Launch				
Feb. 2021	Survey Promotion Letter and Postcard				
	City of UA Social Media Survey Promotion Posts (2)				
	UA Community Newsletter Survey Promo Story				
	City of UA Website Posting Promoting Survey Participation				
	Text/email Invitation to Participate in a Survey				
	Surveys Conducted	2/24–3/4 (N=361)	2/6 – 3/11 (N=145)	2/6 – 3/11 (N=267)	2/6 – 3/11 (N=124)
Mar. 2021	Curbside and Route Waste Audits		3/15 – 3/18 (N=73)	3/15 – 3/18 (N=100)	3/15 – 3/18 (N=56)
	UA Community Newsletter SMTF Campaign Story				
	City of UA Social Media Posts (2) SMTF Campaign				
Apr. 2021	UA Community Newsletter SMTF Campaign Story				
	SMTF Webinar				
	City of UA Social Media Posts (2) SMTF Campaign				
	UA Community Newspaper SMTF Campaign Paid Ads				
May 2021	Compost Mailer				
	Compost Webinar				
	Food Storage Mailer				
	Compost Equipment Instructional Webinar				
	Reducing Food Waste at Home Fridge Magnet Mailer				
	BluApple Food Waste Reduction Give Away				
	Home Composting Equipment Discounts				
	UA Community Newspaper SMTF Campaign Paid Ads				
	Food Waste Reduction Tips Webinar				
Jun-Aug 2021	Survey Promotion Letter, Postcard and Emails				
	City of UA Social Media Survey Promotion Posts				
	Text/email Invitation to Participate in a Survey				
	2nd Surveys Conducted	7/22-8/15 (N=430)	6/3-7/4 (N=75)	6/3-7/4 (N=156)	6/3-7/4 (N=157)
	2nd Curbside and Route Waste Audits		7/19-7/22 (N=45)	7/19-7/22 (N=99)	7/19-7/22 (N=37)

Notes: UA – Upper Arlington, SMTF – Save More Than Food. Shaded areas denote area/group exposed to/participated in the activity. *4.1% of national survey respondents reside in Ohio and could have been exposed to regional SMTF media exposure. N refers to number of food waste measurements collected.

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2.2. Messaging and Interventions

The specific messages and interventions detailed in Table 2.1.1. are included in the appendix. All Upper Arlington households were sent a letter via U.S. mail in February 2021. The letter explained that some foods end up being sent to landfill or composting facilities and that more information about the types and amounts of this food originating from households would help the City of Upper Arlington reduce the amount it spends on solid waste removal. The letter encouraged the qualifying readers (those 18 and older who are responsible for at least half of food preparation duties in their household) to participate in the first survey cycle. Instructions were provided for how to begin the online survey (all who chose to participate provided informed consent prior to starting the actual survey). A single follow-up postcard was also delivered to all Upper Arlington households in March 2021 encouraging those who had not participated in the survey cycle to do so and thanking those who had already participated. Similar messages encouraging survey participation were shared via the City of Upper Arlington's newsletter, social media posts and website. This resulted in 536 Upper Arlington residents providing complete responses to the Spring online survey and 229 participating in the Spring curbside audit of waste.

During March, April and May, Upper Arlington residents in both the treatment and control groups were also exposed to SMTF campaign materials via community newsletter stories, social media posts, paid ads in a local newspaper, and a webinar.

The treatment areas received additional informational materials and outreach. The areas denoted UA-FS and UA-FS+C received mailers with tips on how to reduce food waste via improved storage and a refrigerator magnet with key food waste reduction tips. Those from UA-FS group who completed the opening surveys were also offered access to free or discounted materials that could help them better reduce the amount of food that was wasted.[1] Specifically they were offered free BluApple food waste prevention pods, which absorb ethylene gas in an effort to slow down the ripening of fruits thereby preventing spoilage (see Appendix for product details). Those from UA-FS+C were offered the free BluApple prevention pods and were also offered a package of Biodegradable Products Institute (BPI) certified compostable liners to assist in collecting and transporting kitchen scraps to community food waste drop off sites as well as a discount for obtaining an Earth Machine backyard compost bin.

BluApple pods were requested by 173 households from the UA-FS and UA-FS+C groups. Residents received their pods between May 17 and May 21 via a combination of household delivery and residents picking up their pods from Upper Arlington's administrative office. Thirty-two households from UA-FS+C requested compost bins while 33 requested compostable bags. Residents who requested the backyard compost bin were required to participate in an informational webinar that covered basics of composting as well as how to set up their bin and get started. Households received these materials between May 17 and May 21

[1] These materials were purchased with SWACO funds and were not reimbursed through grant funding.

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through a combination of household delivery and residents picking up their items from Upper Arlington's administrative office.

While only residents in the treatment areas were eligible for receiving the free food waste prevention items (UA-FS and UA-FS+C) and the discounted composting materials (UA-FS+C), all households could attend general webinars focused on food waste prevention tips and composting, though how many who attended the webinar from each area was not recorded. A total of 40 residents attended two webinars.

During June another cycle of promotion to encourage participation among all residents in the post-campaign surveys and audits was conducted. It included promotional letters sent via U.S. mail, follow-up post cards, e-mail messages to those who completed the first survey and messages shared via the City of Upper Arlington's social media accounts. These efforts yielded 388 completed Summer surveys and 181 completed Summer curbside audits.

Recruitment for the national control sample who completed a parallel online survey occurred during an overlapping time period in February and March for the first survey and about a month after the second Upper Arlington survey (in late July and early August). Recruits to the national survey received a message from the vendor inviting them to participate in an online survey "…to understand your use of food at home, and how this may have changed due to how recent events surrounding COVID-19…" Those who met the eligibility criteria (age 18 years or older, conduct about half of the household's meal preparation or more), provided informed consent, and completed the survey received compensation from the vendor. These efforts yielded 361 who completed the first (Spring) national survey and 430 who completed the second (Summer) national survey. 4.1% of national survey respondents reside in Ohio and could have been exposed to regional SMTF media exposure.

2.3. Measurement Approaches

2.3.1. Survey

The first form of measurement involves the use of an online survey that follows the general form developed by van Herpen et al. (2019a) as adapted for U.S. audiences by Shu et al. (2021). The same core survey questions concerning the amount of food wasted by the household were asked of both Upper Arlington residents and national participants, though each group received distinct additional questions. The survey approach begins with a brief survey in which those interested answer several screening questions to verify eligibility (18 years or older and are responsible for at least half of the food preparation duties for their household), provide informed consent to participate, answer some additional demographic questions, and then receive a prompt to monitor the amounts of foods that they purchase but do not eat during the following 7 days in preparation for a follow up survey. In the follow up survey, participants report the amount of food wasted in up to 24 food categories (see Table 2.3.1) and its most frequent form (e.g., completely unused/unopened foods, partly used foods, plate waste, or unwanted stored leftovers). Participants were told to report discarded food regardless of its destination, i.e., even if it was composted or fed to a pet. The survey version administered to Upper Arlington residents

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included several additional questions, including about attitudes, awareness and household food handling practices, and questions concerning the Save More Than Food Campaign itself.

Table 2.3.1. Categories tracked in study by measurement approach.

Survey	
• Fresh vegetables & salads	• Other vegetables (jar / canned / frozen)
• Fresh fruit	• Other fruit (jar / canned / dried / frozen)
• Beans, lentils, chickpeas, etc.	• Sandwich ingredients (deli meats, cheese slices, relishes, etc., but report lettuce & vegetables in 'fresh vegetables and salads')
• Bread	• Potato products (fries, hash browns, etc. - report potato chips under 'salty snacks')
• Potatoes	• Cereals (breakfast cereal, corn meal, oats, etc.)
• Eggs	• Cheese (report cheese slices under 'Sandwich ingredients')
• Pasta	• Rice and other grains (including wraps, couscous, etc.)
• Soups / stews	• Meat (please report deli meat under 'sandwich ingredients')
• Yogurt, custard, etc.	• Condiments and sauces (ketchup, mayonnaise, cocktail sauce, etc.)
• Meat substitutes	• Candy / cookies / granola bars / chocolate bars
• Fish	• Salty snacks (chips / nuts / pretzels, etc)
• Alcoholic beverages	• Non-alcoholic beverages (milk, juice, soda. Exclude: water, tea, coffee)
Audits	
• Fruits & vegetables • Dairy & eggs • Leftovers • Inedible	• Baked goods • Meat & fish • Miscellaneous • Unopened food packages

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Surveys of this form have been documented to provide estimates of household food waste that are substantially smaller than the amount of waste food observed in contemporaneous audits of household waste streams (van Herpen et al. 2010b WM), but the degree of underreporting is thought to be consistent over time. Taken together this suggests that surveys can reliably track changes in household food waste over time, but that the amount reported at any particular time is likely to be substantially less than the amounts that would be identified in a physical audit of household waste.

The survey yields quantitative estimates of the amount of food wasted with respondents specifically directed to include amounts that might have been used for other productive purposes (composting or feeding pets) and to exclude typically inedible parts such as pits, bones and peels from these estimates. During the survey administered to Upper Arlington residents, we also asked participants if they would consent to having their household's waste collected in the near future so that the amount of food discarded could be measured as part of this study. Those who consented to this curbside audit of waste provided their address so that curbside collection could occur. The complete survey is included in the appendix.

2.3.2. Waste Audits

Two types of audits were conducted: at the individual household level for those households who consented to participate (Household Waste), and samples of all material collected at the curbside for several collection routes (Route-level Waste). Once collected and transported to a covered location, staff weighed the total waste sample, isolated and weighed the food waste, sorted the food waste into the mutually exclusive categories listed in Table 2.3.1, weighed each category of food waste, and verified the sum of weight across the food waste categories reconciled with the weight measured for the unsorted food waste. Weights were collected by placing waste in plastic containers before measuring via digital scale with the weight of the empty box netted from the recorded weight. Weights were encoded immediately into a spreadsheet accompanied by an identification number (randomly assigned household number or route number).

2.3.2.1. Household Waste

Staff traveled to the addresses of consenting households on the morning of the household's normal waste collection day. Upon arrival staff collected waste from all consenting households who had placed containers with waste in its normal collection location (e.g., some households did not provide containers as they may have been traveling or forgot to put out the trash) or were rejected for other reasons (e.g., some placed out containers that were simply too heavy to be lifted onto the trucks). Random identification numbers were attached to each household's waste before transport to the covered location for sorting and measurement.

2.3.2.2. Route-level Waste

Samples of waste generated by households who did not volunteer for individual monitoring of curbside waste were also collected. In each of the three Upper Arlington areas, samples were obtained from the mixed refuse contributed curbside by such households on four different collection routes for a total of 12 samples community wide. Samples of approximately 300 pounds were drawn from waste collection vehicles upon the completion of collection on each route where each route serviced households from a single treatment or control area. Each area

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featured several established waste collection routes; routes containing the greatest number of households that participated in the waste survey and household waste audits were chosen such that the route-level waste audit best represented the households with individual-level measurements. Note that the route-level samples exclude waste from households that consented to individual household waste audits as the samples were drawn on the same day that individual households' waste was collected separately from the route waste. Hence, the route-level audits represent the waste tendencies of households who did not volunteer for the individual waste audits.

3. Results

3.1. Participation and Demographics

Table 3.1 contains summary statistics for some key characteristics of those who responded to the surveys in both the Upper Arlington and National samples at both time periods. The characteristics of the national sample differ from the Upper Arlington sample in a statistically significant manner for every category. The Upper Arlington sample features a larger proportion of participants: in the middle age category (25-64); with households consisting of 3 or 4 members; with higher levels of formal education; who are employed full time or are a student; in the highest income category; who identify as White and not Hispanic; and who shop for food weekly. Hence, we control for key participant characteristics when comparing responses for Upper Arlington and National samples to ensure differences in food waste behaviors, attitudes, knowledge levels and practices are not attributed to personal and household characteristics. These include participant age, household size, respondent sex, region of the country, and if the respondent noted any household event that might have altered normal food waste patterns during the measurement week (e.g., hosting a party). In particular, household size and age have been established as key factors in the amount of food wasted by a household increasing in the number of household members (but decreasing in the amount per person) and decreasing with age (Schanes et al. 2018). For attitude and knowledge analyses, respondent education level and income were also controlled. Note the total number of observations listed in Table 3.1 exceeds the number of completed food waste measurements reported in Table 2.1.1 because of non-response to food waste measurement questions by some survey participants.

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Table 3.1. Respondent Characteristics for Upper Arlington and National Samples

Characteristic[A]	Upper Arlington[B]	National	
Age			
<35	8.7	17.8	
35 – 64	65.2	42.3	$\chi^2(2) = 120.1$
65+	26.1	39.9	$p < 0.001$
Household Size			
1	19.2	27.4	
2	34.2	43.3	
3	19.7	11.4	
4	20.0	7.4	$\chi^2(4) = 108.8$
5+	9.9	10.5	$p < 0.001$
Education			
High School or less	0.6	14.4	
Some College	5.3	26.7	
College Degree	40.2	33.6	$\chi^2(3) = 443.3$
Grad/Professional	53.8	25.3	$p < 0.001$
Employment			
Full Time or Student	52.5	37.0	
Part Time	14.7	8.4	$\chi^2(2) = 108.9$
Other	33.1	54.6	$p < 0.001$
Income			
<$50,000	5.3	31.2	
$50 – 99,999	15.8	35.4	
$100k - $149,999	19.4	17.2	
$150,000+	39.0	12.5	$\chi^2(4) = 603.2$
No Answer	20.5	3.6	$p < 0.001$
Self-identified Race			
Asian	4.9	6.6	
Black	0.0	6.2	
White	90.7	82.3	$\chi^2(3) = 77.1$
Other affiliations	4.4	4.8	$p < 0.001$
Identify as Hispanic	1.6	5.9	$p < 0.001$
Food Shopping			
Less than weekly	12.8	22.3	
Weekly	57.6	50.2	$\chi^2(2) = 35.6$
More than weekly	29.7	27.5	$p < 0.001$

Notes: A – characteristics of household or survey respondent. B – percent in each subgroup. Final column reports the chi-square test statistic for significant differences between Upper Arlington and the National samples for the characteristic. Upper Arlington sample size ranges from N=1151 (age) to N=1159 (employment, race, ethnicity and food shopping) to N=1181 (income, education and household size). National sample size ranges from N=1066 (age) to N=1112 (employment, race, ethnicity and food shopping) to N=1168 (income, education and household size). The Upper Arlington figures include 342 participants who responded to both Spring and Summer surveys, while there were no known repeat responders to the National survey. 59% of Upper Arlington's responses were to the Spring survey while 43% of National responses were to the Spring survey.

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3.2. Awareness, Attitudes, Knowledge and Practices

Awareness

Participants in the Spring and Summer surveys administered in Upper Arlington reported their awareness of the SMTF campaign ('In the past 30 days, do you recall seeing or hearing about the "Save More Than Food" campaign?'). There was a large increase between Spring (6.5% report 'yes') and Summer (41.8% report 'yes), though the increase is statistically similar for the treatment and control areas within Upper Arlington (a 30 percentage point increase in control areas vs. a 37 percentage point increase in treatment areas, which is not statistically significant even when controlling for differences in age and education via regression).

The most frequent sources for hearing about the campaign are listed in Table 3.2. The Community Newsletter, materials mailed via U.S. postal service and e-mailed materials were the most frequently mentioned. Paid media (television and online advertisements) were mentioned infrequently, as were printed fliers.

Table 3.2. Source of Hearing About the Save More Than Food Campaign

Source	% of Mentions
Community newsletter	27.1%
Mailed materials (physical mailbox)	24.5%
Emailed materials	18.3%
Facebook	8.8%
Printed flyer	7.5%
Not sure	5.6%
Television	1.6%
Twitter	1.6%
Internet search	1.3%
Online advertisement	1.0%
Word of mouth	1.0%
Instagram	0.7%
LinkedIn	0.7%
None of these	0.3%

Notes: 197 respondents mentioned 306 sources.

During the summer survey, respondents were asked to evaluate the effectiveness of the SMTF campaign in (a) driving awareness of food waste as an important topic and (b) creating action around food waste reduction. More than 57% of respondents said the SMTF campaign was either effective or very effective in driving awareness of food waste as an important topic while only 40% said it was effective or very effective at creating action around food waste reduction. For both questions, the perceived effectiveness of the campaign was greater in the areas that received the more intensive campaign, with a statistically significantly larger percent in the treatment vs. control areas for the awareness question (64% vs. 46%) and a marginally significantly larger percentage (46% treatment vs. 31% control) for the action question.

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Receiving materials via direct mailer or paid advertising did have greater impacts in terms of creating awareness about the importance of food waste and creating actions to reduce food waste. For respondents who recalled receiving communication materials via community newsletters, email and social media posts, 68% said the SMTF campaign was either effective or very effective in improving awareness of food waste, while 28% said the campaign was either effective or very effective in creating actions to reduce food waste. For respondents who received direct mailers and fliers, around 80% (12 percentage point improvement) said the SMTF campaign was either effective or very effective in driving awareness of food waste as an important topic while 40% (12 percentage point improvement) said the campaign was either effective or very effective in creating actions to fight food waste. These results suggest that using paid communication materials such as direct mailers could be helpful in raising the general public's awareness about food waste and potentially lead to better food waste reduction outcomes at the household level. One possible challenge is improving the recall rate of paid materials. According to the summer survey, among respondents who were aware of the campaign, only 58% recalled receiving paid advertising and only 47% recalled receiving direct mailers. If the recall rate can be further improved, the perceived effectiveness of the campaign could be further improved.

These results suggest several things. **The campaign increased awareness.** First, before the intensive, localized campaign, even among those motivated to respond to the survey, very few within Upper Arlington (6%) recalled the SMTF campaign. Note that the survey was fielded about six months after the media launch of the campaign across central Ohio. However, by the end of the Upper Arlington campaign, about 40% of survey respondents recalled the SMTF campaign. This compares favorably to large national campaigns such as Save The Food, which reported a recall rate for its Public Service Announcement of 35% (shortywawards.com). The majority those recalling the campaign at the time of the summer survey found it to drive awareness of food waste as an important topic (57%), though less than a majority (40%) found the campaign to create action to reduce food waste.

Second, the additional materials available to the treatment areas did not yield significantly greater general recall of the SMTF campaign than in the control area, but it did yield a statistically significantly greater increase in perceived effectiveness of the campaign both in terms of awareness of food waste as an important topic and in terms of creating action around food waste. This suggests **the efficacy of the additional materials lies in their ability to alter perceived effectiveness of the campaign rather than general awareness of the campaign itself.**

Finally, **the communication modes that were commonly remembered as a source for information about the SMTF campaign included both unpaid (community newsletter, e-mails, Facebook posts) and paid (direct mail via the U.S. Postal Service) efforts. We note that several paid media approaches (television, online advertising) were not frequently recalled by survey respondents.**

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Attitudes

Attitudes were assessed by asking participants about their level of agreement with a number of statements concerning food waste via a four-point scale with larger values implying stronger agreement with the statement. The average results for Spring and Summer across all areas within Upper Arlington are reported in Table 3.3 along with the treatment effect. The treatment effect is estimated using ordinary least squares regression to control for differences in personal characteristics between the treatment and control groups that could drive differences in responses (income, age, race, education, household size). The responses from both treatment areas within Upper Arlington are pooled into a single treatment group for the purposes of this analysis.

The treatment effect represents the change in response plausibly attributable to the participant receiving the additional materials available only to the treatment group. For example, for item 1 ("Throwing away food is bad for the environment") the treatment effect is -0.326, meaning that, once any differences in personal characteristics are controlled, being in one of the treatment areas rather than in the control area was associated with a decrease in agreement with this statement by 0.326 scale points (on a scale from 1 to 4) between Spring and Summer. Given the Spring mean value was 2.44, this represents a 13.3% decline. The final column provides the p-value, an indication of statistical significance of this result, which reflects the observed variability of the sample data and the power of inference offered by a sample of this size. The p-value indicates the likelihood that treatment effect could be -0.326 rather than zero simply due to sampling error (the fact that not all households are in the study) or due to modeling error (we don't control for all possible confounding factors), with values less than 0.05 interpreted as statistically significant and values between 0.10 and 0.05 interpreted as marginally statistically significant.

The results suggest that **within Upper Arlington attitudes changed little between Spring and Summer** with the Summer average never being more than 6% different than the Spring value with the simple difference in means never achieving statistical significance. **Furthermore, only two of the 11 treatment effects (items 4 and 7) are statistically significant (one at the marginally significant level) with participants in the treated areas indicating a larger decrease in agreement with these statements than those in the control area.**

Item 4 is "You don't have enough time to worry about the amount of food you waste." Most participants strongly disagreed with this statement during the Spring (mean = 1.13). The treatment effect is -0.288, which implies a nearly 25% Spring to Summer decrease for those in the treatment group compared to those in the control group once demographic differences are controlled. This suggests that those in the treated areas came to be more uniformly in strong disagreement with this statement, suggesting the materials were effective in drawing attention to the food waste as an issue warranting participant concern.

Item 7 is "You waste more food when you buy things in large packages or when you buy in large quantities during a sale." Again, most participants in the Spring, regardless of being in a treatment or control area, disagreed with this statement (mean = 1.95 with 2 being 'somewhat

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Table 3.3 Upper Arlington Food Waste Attitudes and Estimated Treatment Effects.

Attitudes	Period	Mean	N	Treatment Effect	p-value
1. Throwing away food is bad for the environment	Spring	2.44	768	-0.326	0.148
	Summer	2.50	536		
2. You throw away food if the package date has passed	Spring	1.78	768	-0.200	0.263
	Summer	1.71	536		
3. You feel guilty when you throw away food	Spring	2.55	768	-0.327	0.151
	Summer	2.50	536		
4. You don't have enough time to worry about the amount of food you waste	Spring	1.13	768	-0.288	0.021**
	Summer	1.17	536		
5. Some food waste is necessary to make sure meals taste fresh and good	Spring	1.55	768	-0.096	0.562
	Summer	1.65	536		
6. It would be difficult to reduce your household's food waste any further	Spring	1.72	768	-0.220	0.211
	Summer	1.73	536		
7. You waste more food when you buy things in large packages or when you buy in large quantities during a sale	Spring	1.95	768	-0.354	0.069*
	Summer	2.05	536		
8. Your household wastes more food than other households of similar size	Spring	1.08	768	-0.140	0.223
	Summer	1.11	536		
9. You should make an effort to reduce food waste when possible	Spring	2.69	768	-0.356	0.134
	Summer	2.74	536		
10. Your actions to reduce food waste make a positive difference for your family	Spring	2.46	768	-0.230	0.305
	Summer	2.54	536		
11. Your actions to reduce food waste make a positive difference for your community	Spring	2.58	768	-0.281	0.222
	Summer	2.63	536		

Notes: Scale: 1 = Disagree Strongly, 2=Disagree Somewhat, 3=Agree Somewhat, 4=Agree Strongly. Treatment effect controls for differences in spring and summer respondents' characteristics using regression. P-values indicate the statistical significance of the estimated treatment effect with values less than 0.05 deemed statistically significant and accompanied by a '**' and values between 0.10 and 0.05 deemed marginally statistically significant and accompanied by a '*.'

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disagree'). The treatment effect is -0.354, which implies an 18% Spring to Summer decrease for those in the treatment group compared to those in the control group. This suggests that those in the treated areas came to be more uniformly in strong disagreement with this statement, suggesting the intervention materials were effective in helping participants mitigate food waste occurring due to large or bulk purchases.

Table 3.4. Treatment Effects on Self-Reported Food Waste Knowledge

Knowledge	Period	Mean	N	Treatment Effect	p-value
1. Compost Knowledge	Spring	0.67	542	-0.037	0.848
	Summer	0.69	388		
2. Food Storage Knowledge	Spring	1.06	529	-0.137	0.304
	Summer	0.98	388		
3. Prevention Tactics knowledge	Spring	1.11	537	-0.203	0.138
	Summer	1.04	388		

Notes: -2 = No knowledge at all, 0 = Somewhat knowledgeable, 2 = Very knowledgeable. Treatment effects control for differences in spring and summer respondents' characteristics using regression. P-values indicate the statistical significance of the estimated treatment effect with values less than 0.05 deemed statistically significant and values between 0.10 and 0.05 deemed marginally statistically significant.

Upper Arlington participants provided a self-assessment of their knowledge about composting, food storage and food waste prevention during the Spring and Summer surveys on a five-point scale ranging from -2 (No knowledge at all) to +2 (Very knowledgeable) with 0 representing 'Somewhat knowledgeable.' The results are summarized in Table 3.4 and suggest that **most participants view themselves as at least somewhat knowledgeable on all practices, though least knowledgeable about composting. The results reveal very little change between Spring and Summer and no significant treatment effects.**

Table 3.5. Treatment Effects on Self-Reported Waste Prevention Practice

Practices	Period	Mean	N	Treatment Effect	p-value
1. Shop with a list	Spring	3.53	475	0.013	0.893
	Summer	3.42	325		
2. Create a meal plan	Spring	3.14	349	0.091	0.503
	Summer	3.13	216		
3. Proper food storage	Spring	3.40	463	-0.055	0.538
	Summer	3.35	335		
4. Eat bruised or discounted food	Spring	3.52	91	0.031	0.888
	Summer	3.53	66		

Notes: 1 = Tried it once, 2 = Occasionally, 3 = Regularly, 4 = Every time. Treatment effect controls for differences in spring and summer respondents' characteristics using regression. P-values indicate the statistical significance of the estimated treatment effect with values less than 0.05 deemed statistically significant and values between 0.10 and 0.05 deemed marginally statistically significant.

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A similar pattern emerges in Table 3.5, where results are reported for participants' self-reported frequency of waste-prevention practices on a four-point scale where 1 indicates the participant has 'Tried it once,' 2 is 'Occasionally,' 3 is 'Regularly,' and 4 is 'Every time.' The mean for all practices lies between implementing the practice regularly and every time though the practice of creating a meal plan is the least frequently reported practice. No treatment effects are statistically significant. The fact that so many participants rated their Spring use of these practices at the highest level (a four on the four-point scale) may give rise to greater difficulty in identifying treatment effects as the participants have little room to increase their frequency of using the practice (so-called 'ceiling effects').

In summary, **the attitudes, knowledge and practices of participants concerning food waste were not very different in any instance between Spring and Summer surveys and the additional materials and interventions provided to participants in the treatment areas appears to have spurred few significant treatment effects with those few significant results occurring in the domain of participant attitudes**. While identifying treatment effects for food waste practices may have been hampered by ceiling effects, such issues were not a concern for participant attitudes and knowledge. We also verify that restricting analysis to only those residents who responded to both the Spring and Summer surveys (N=161 for attitudes and knowledge questions, N = 142 for shops with list and proper food storage, N=105 for creates meal plan, N=18 for eat bruised or discounted food) does not alter these results.

We conclude that **campaign materials achieved limited effectiveness in altering self-reported food waste attitudes, knowledge and practices among Upper Arlington residents who participated in these surveys but did significantly increase awareness of the SMTF campaign with many unpaid communication approaches identified as important sources of information about the campaign. Conditional on awareness of the campaign, the SMTF campaign was seen as effective at increasing awareness about the importance of the topic of food waste by a majority and as creating action around food waste reduction by about 40% of aware respondents.** Further, the perceived effectiveness of the campaign was significantly influenced by the additional materials made available to those in the treatment areas. However, as discussed in the section on research design, the physical adjacency of the treatment and control areas and the considerable amount of campaign materials emphasizing food waste shared in both control and treatment areas may have limited our ability to identify true treatment effects associated with campaign materials.

3.3. Food Waste

Figure 3.1 displays several key results concerning food waste measures reported from the survey for the Upper Arlington and National sample participants. The height of the bars is expressed in grams of food waste per person per week. Note that the survey directed participants to only consider discarded food that was once deemed edible (e.g., excluding bones, pits, etc.).

The numbers in Figure 3.1 are the regression-adjusted means for the most frequent Upper Arlington household pattern: a household with two people aged 35-65 where the survey

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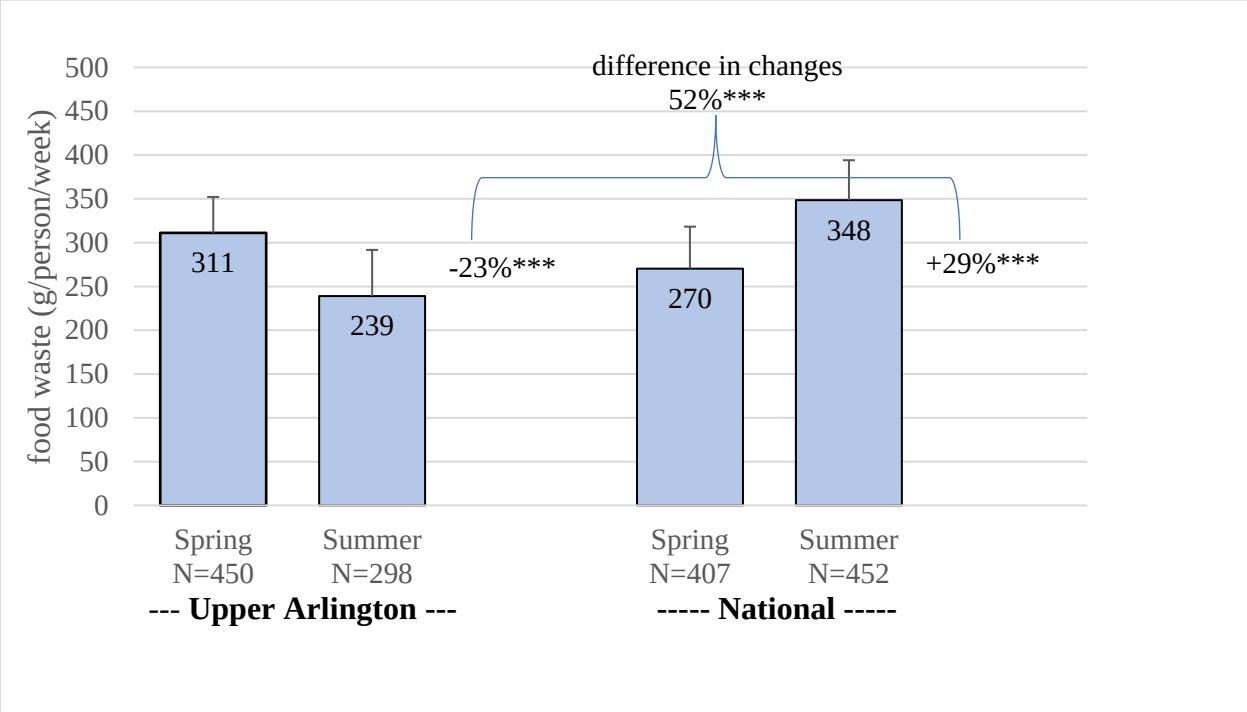
respondent is female and the household featured an event that caused more food waste than was typical for that household. Note: regression-adjusted means could also be derived for a different household pattern, e.g., a household with 4 people, and those values would be larger. However, because respondents to the spring and summer surveys had slightly different household characteristics on average, the figure provides the estimate for the same type of household during both spring and summer periods.

Figure 3.1. National vs. Upper Arlington Survey, Results for Self-Reported Food Waste



Notes: Regression-adjusted means for a typical responding Upper Arlington household: 2 people where the respondent was age 35 – 65 and female. Error bars depict 95% confidence intervals. *** depicts changes that are statistically different from zero at the 1% level. Surveys did not assess inedible food scraps. The 'difference in changes' is the difference in seasonal changes between Upper Arlington and the National samples. The number of observations is less than the number listed in Table 2.1.1 because some observations are omitted due to missing control variables needed to conduct the regression.

The figure reveals that the amount of food wasted in Upper Arlington trended downward with less waste reported during Summer while the national self-reported waste trended upward between Spring and Summer. Upper Arlington participants reported a 23% decrease in waste from spring to summer ($p < 0.01$). In contrast, the amount of waste reported by the national survey sample increased by 29% between Spring and Summer ($p < 0.01$). When contrasting the food waste amounts captured by survey, the difference in the Upper Arlington and National seasonal trends (the difference in seasonal changes or the difference in differences) is a 52%

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Figure 3.2. Number of Waste Categories Self-Reported via Survey by Sample and Season

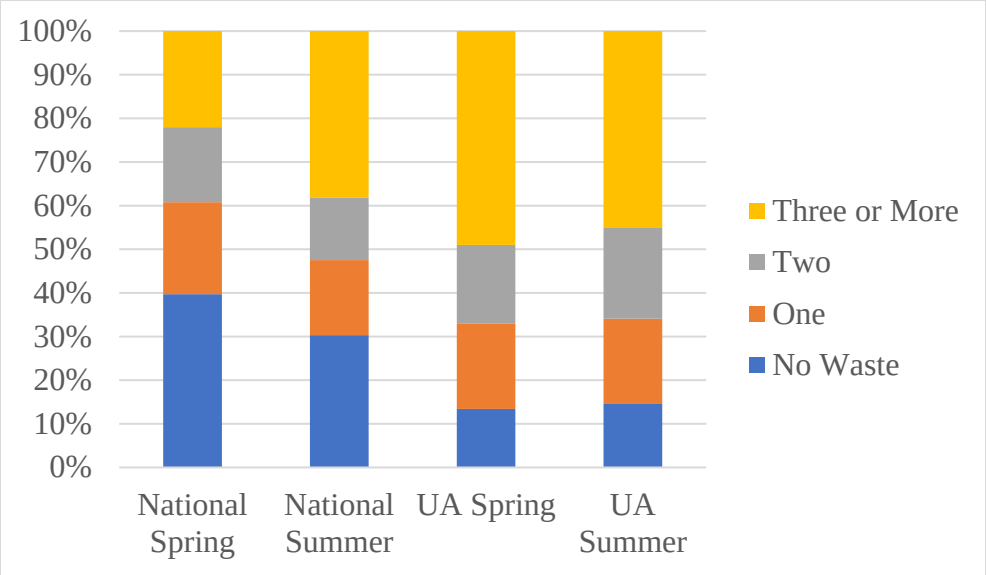
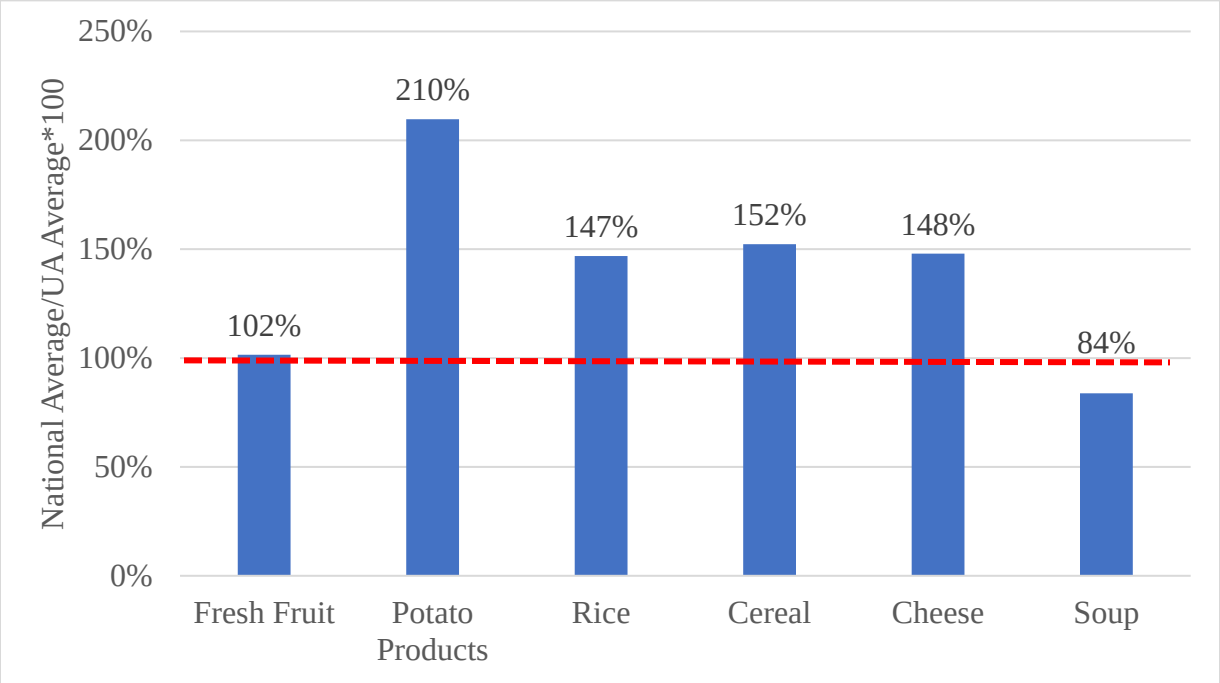


Figure 3.3. Self-Reported Waste: Upper Arlington as a percent of National



Notes: The red line indicates equal levels reported on average by the National and Upper Arlington samples among those who reported positive waste levels in that category. The remaining 18 of the 24 categories featured no significant difference between the amount of food wasted between the national and Upper Arlington samples and are not pictured.

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difference (29% minus a negative 23%), which is also statistically significant ($p < 0.01$), and this assessment accounts for differences between Upper Arlington and the National samples in terms of respondent and household characteristics identified in Table 3.1 through our use of a regression that controls for these differences. **We summarize that the campaign was effective in reducing the amount of edible waste reported on surveys.**

One notable difference between the Upper Arlington and National samples is that the two samples report statistically different levels of waste during the Spring reporting period with 47% more waste reported by the Upper Arlington sample (325 vs. 221 g/person). To understand the origins of this difference we depict the number of different waste categories in which survey respondents indicated a positive level of waste in Figure 3.2 and, among participants who report any positive waste in a category, the relative amounts of waste (the ratio of National to Upper Arlington) reported (Figure 3.3).

The main takeaway from Figures 3.2 and 3.3 is that Upper Arlington participants were more likely to mark that there was some amount of waste in more categories than the National survey participants but, once any amount of waste was indicated for a particular category, the Upper Arlington participants indicated similar or lower levels of waste per category. The first point is clear from Figure 3.2, where we see that the National sample had a much smaller proportion that reported positive waste in three or more categories (e.g., about 20% of the national sample reported 3 or more categories in the Spring while about 50% of the Upper Arlington sample reported three or more categories in the Spring). The second point is clear from Figure 3.3, where the footnote indicates among households that report any waste in a particular category, no significant difference in the amount of waste is reported by National and Upper Arlington households for 18 of the 24 categories.

A key difference between the National and Upper Arlington samples is in the way they were recruited to participate in the survey. The Upper Arlington sample was recruited with letters sent via U.S. mail, local media articles, and local social media posts that all motivated participation by mentioning that the information would be beneficial to Upper Arlington for local planning purposes. In contrast the national sample was recruited as part of standing consumer panels where participation was motivated as another way for the panelists to earn money for filling out surveys (Upper Arlington participants were not directly compensated for completing surveys). While the topic of food was also mentioned as part of the national sample recruitment, it was not as central to the verbiage and the national sample had no motivation that the results would be used for the benefit of local planning activities.

Hence, reporting more categories of waste may be consistent with the likelihood that Upper Arlington participants were more motivated to participate and therefore more diligent in providing complete information to aid local efforts due to the manner in which they were recruited. That is, the National survey participants may have had less motivation to think critically about all 24 categories of waste and less motivation to report small amounts in additional categories as this would lengthen the amount of time it would take to complete the survey and earn the fixed amount of compensation offered for participation. However, once motivated to recall and report in a category, it takes the same amount of time and effort to report

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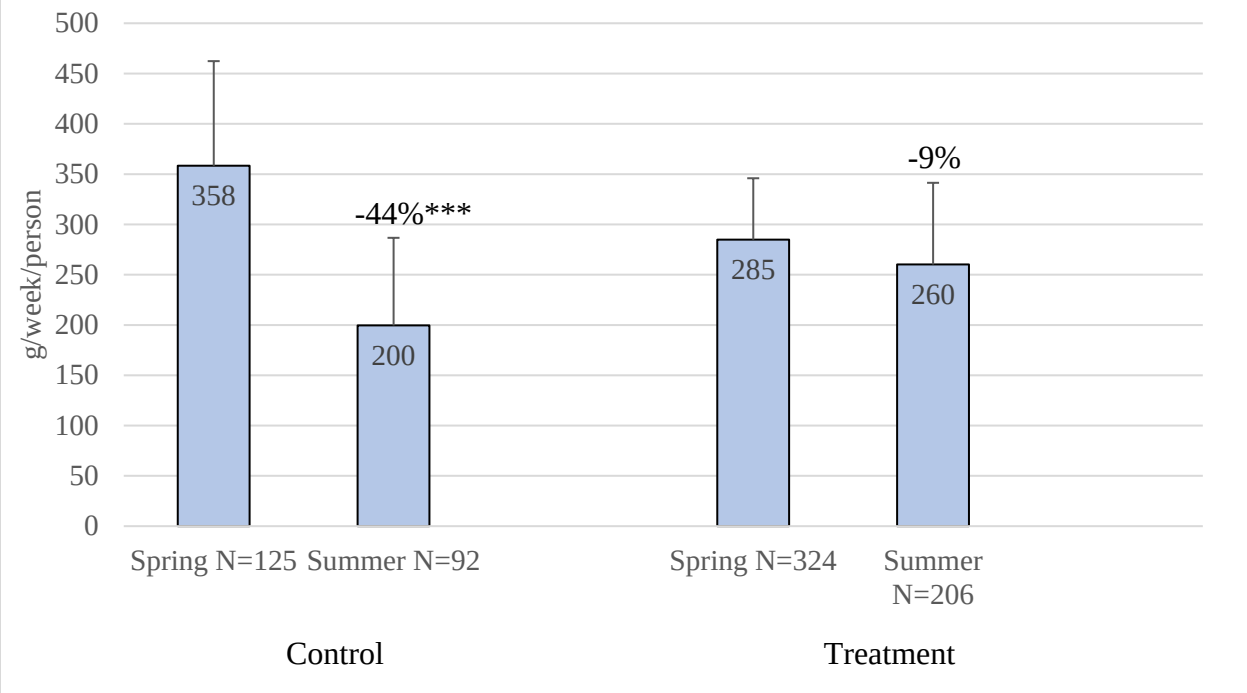
the level of waste (choosing from among several categories of waste). Hence, in Figure 3.3, we see that the amounts of waste reported are largely similar between the Upper Arlington and National samples with no significant difference in 18 of 24 categories where positive waste is reported. In fact, for five of the six categories with significant differences, the National sample reported greater waste levels despite have substantially smaller waste levels when summed across all categories.

These patterns provide additional context for interpreting the changes in each group between Spring and Summer. For the national sample, the percent of participants reporting three or more categories of waste nearly doubles between spring and summer. If the national participants were saving effort by reporting zero waste in categories with small amounts of waste, it suggests that actual waste levels become much larger and triggered more categories to be reported during summer. For Upper Arlington, the number of categories reported stayed relatively constant between spring and summer, suggesting that the reduction in waste came from actual reductions in the amounts of waste occurring in those categories with positive waste.

Figure 3.4 breaks out the Upper Arlington survey waste figures into those areas that received the more intensive campaign materials and the control area. Both groups reported a reduction in waste, though somewhat unexpectedly, the control area reported the greater reduction and the reduction reported in the treatment area is not statistically significant and the difference in seasonal declines was not statistically significant. Hence, the more intensive use of campaign materials does not appear to translate to a greater reduction in the amount of once edible food reported as waste by survey respondents.

Figure 3.4. Self-Reported Waste Estimates by Area within Upper Arlington



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Notes: The difference in seasonal changes is not significantly different between the Control and Treatment areas.

Curbside Audits within Upper Arlington

Figure 3.5 depicts key results from households who volunteered to have their curbside waste measured via audit. Note that, unlike Figure 3.1, the values are in grams per household per week rather than grams per person per week because we did not have the number of household members available for all audited households.[2] The results show that summer waste figures for all UA households were lower than spring figures by 21% with a 17% reduction among once edible food that was wasted and a 30% reduction among inedible food scraps. Only the reduction among inedible food scraps was statistically significant, however.

Given the potentially important role of composting in affecting the amount of wasted food and food scraps that enter the audited waste stream, Figure 3.5 also breaks out these results for the area that received the intensive composting intervention (Area Storage + Composting) and the other areas (Area Storage Only and the control area). The overall reduction in area exposed to the intensive composting intervention was greater (42%, which was statistically significant) and also featured a statistically significant reduction in once edible food (53%) as well as a 26% reduction in inedible food scraps (though this was not statistically significant). The other areas, which did not receive the intensive composting intervention, largely mirror the overall results though the reduction in total and once edible waste are slightly smaller.

While the reduction in total waste and once edible wasted food was greater for the area receiving the intensive composting intervention than for the other areas, the difference in these reductions (the difference in changes) was not statistically significant. Hence, we cannot definitively attribute these larger declines to the intensive composting intervention. Further, we note that the area with the intensive composting intervention exhibited a larger starting amount of inedible waste on the spring audits (893 vs 616 g/household/week), where that difference is marginally significant. This may suggest that this area had an incidentally high level of inedible waste during the first audit and some of the reduction captured in the second audit was simply due to households in this area exhibiting more typical waste levels (regression to the mean effects rather than the effects of a successful intervention). We note there was no such divergence in initial amounts between these areas in terms of once edible food that was wasted (1,478 vs 1,423 g/household/week, not significantly different), hence we are more confident in ascribing the reduction in edible waste observed in this area to the intensive composting intervention it received.

[2] Among those audited where household size is available, the number of household members is about 3% smaller among summer respondents (2.72 vs. 2.82), which is not significantly different.

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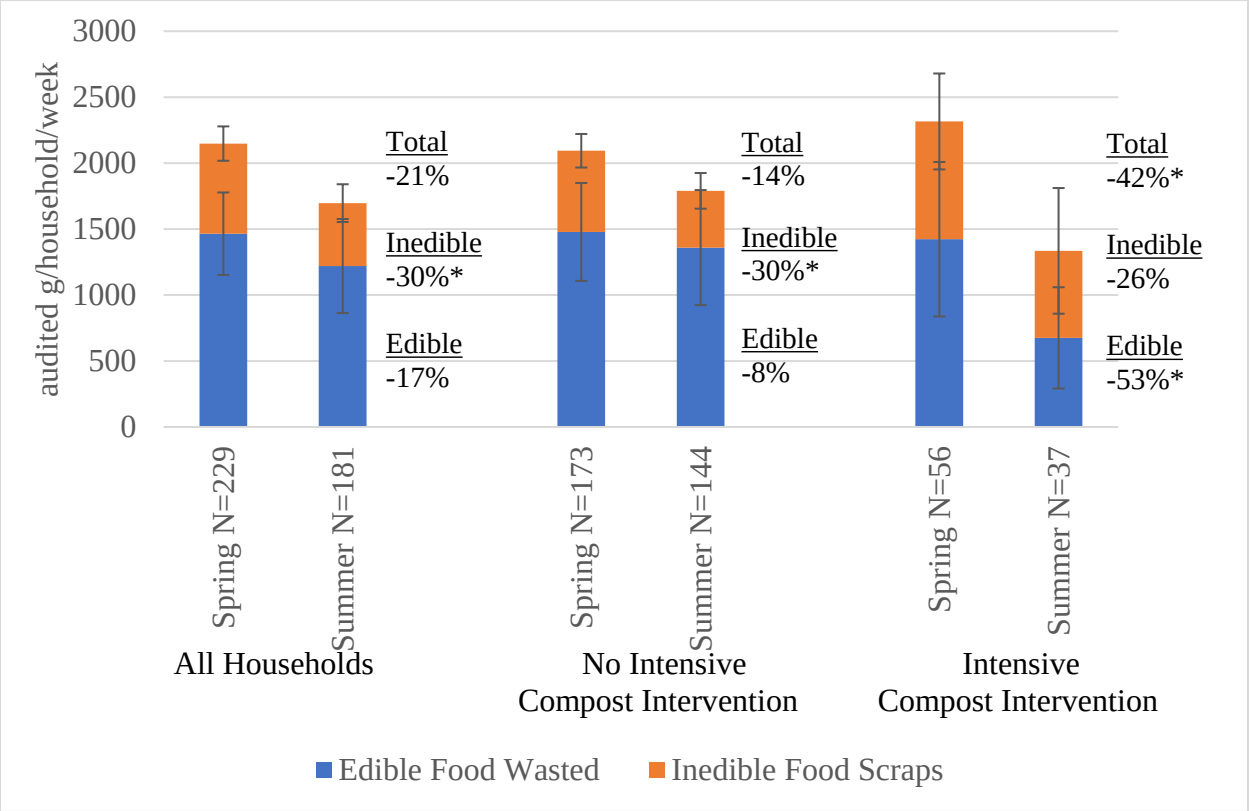
Figure 3.5. Audit Results: Edible Food Wasted and Inedible Food Scraps by Season



Notes: Error bars depict 95% confidence intervals for each subsection of each bar. Intensive compost intervention (UA – FS+C), while No Intensive Compost Intervention includes UA-Control and UA-FS. Unlike waste figures from the survey, audit figures are on a per household basis rather than a per person basis (due to some missing household size figures among audited households), include inedible food scraps, which were not measured by the survey, and do not control for other respondent characteristics. The difference in the amount audited figures decline between the two depicted areas is not statistically significant for the total, inedible nor edible waste figures.

If we were to only analyze those who completed both the survey and audit (not pictured), we find that there remains a seasonal decline in edible food waste reported on the survey, but that it is 37% smaller than that reported for the original group and the decline is no longer statistically significant. This is not too surprising given that the sample who were willing to undertake both the survey and the audit featured statistically significant differences in their characteristics. Specifically, those who participated in both survey and audit were more likely to be from households with more formal education, higher incomes and represented by a female survey taker.

Both the audit and the survey results permit an assessment of the types of food wasted (Figures 3.6 and 3.7). Whether measured by audit or survey, **fruits and vegetables proved to be the largest fraction of all food wasted by far** and, according to the survey figures, fresh produce was much more wasted than items that might be stored for longer periods (frozen, canned, dried). The second largest category among the audit results was ‘leftovers’ which may

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also contain significant fresh produce items. The more expensive and energy-dense items, such as meat, fish, dairy and eggs, were much smaller fractions of overall waste. The dominance of produce in the wasted food mix is a finding that is common to other studies as well (Hoover and Moreno 2017), suggesting that narrowing future intervention materials to focus on produce could prove useful. While the current intervention reduced fresh produce waste, the reductions were not statistically significant when compared against the national sample.

Figure 3.6. Audited Waste by Category

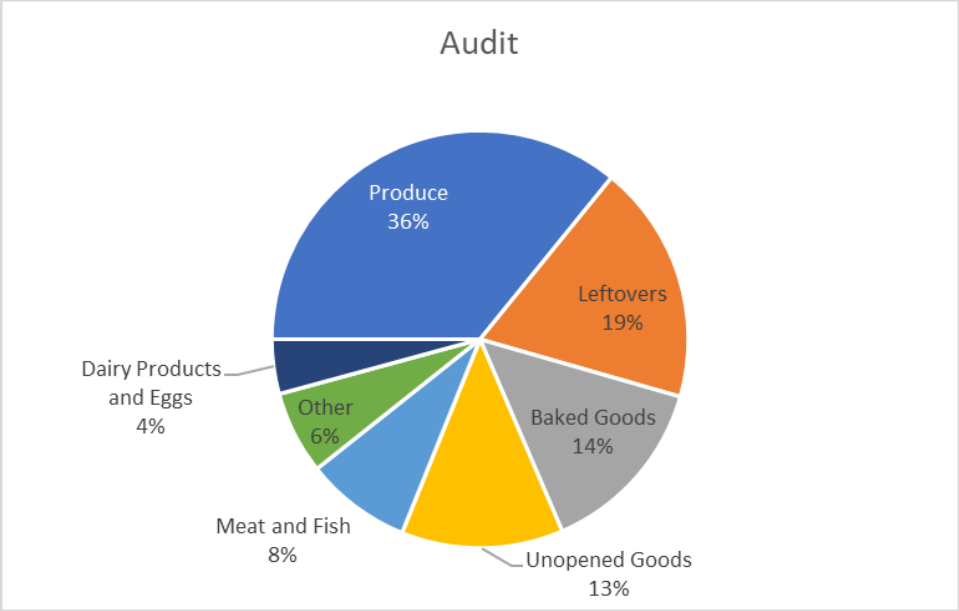
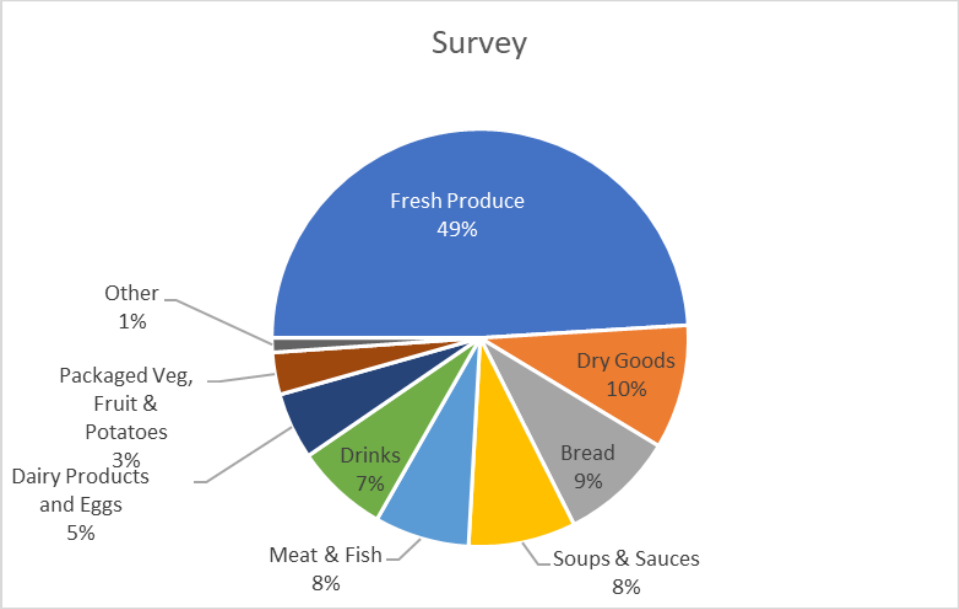


Figure 3.7. Surveyed Waste by Category



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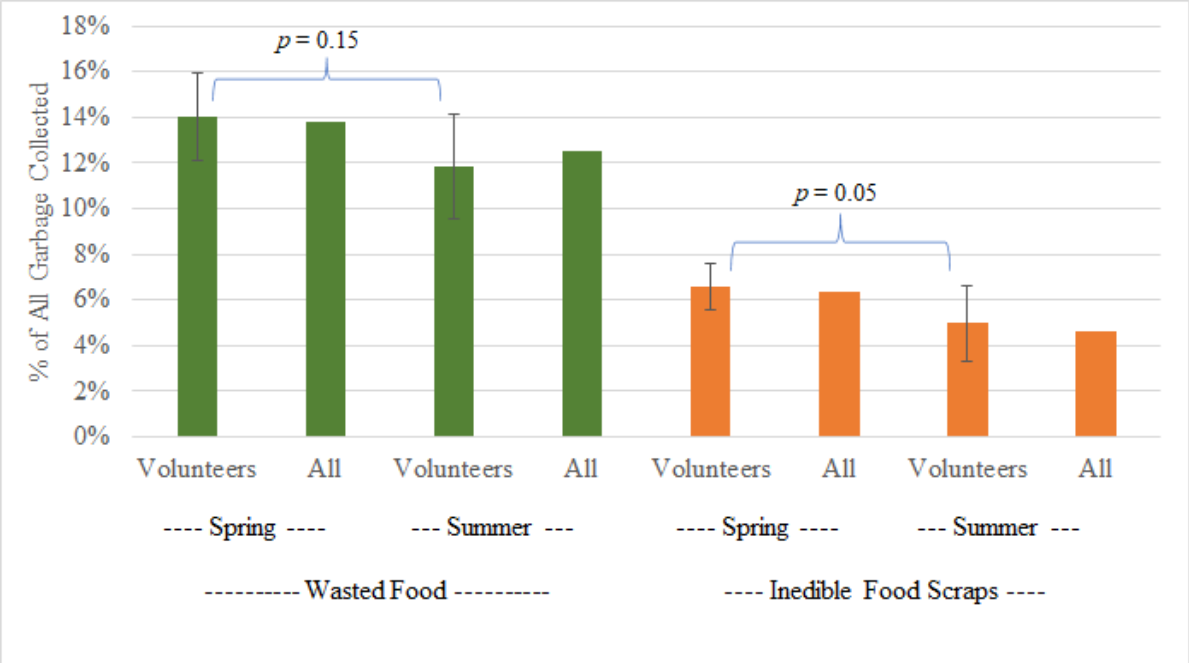
When respondents reported waste on the survey, they were asked to denote if the discarded items were completely unused, partly used, discarded as plate waste, or discarded after being a leftover in the refrigerator. Vegetables were most likely to be reported as partly used (61%) or completely unused (27%), whereas fruits were most likely to be reported as completely (57%) or partly (36%) unused. **This suggests two possible ways to focus an intervention to reduce produce waste: (1) help households purchase less produce such that purchases match final use or (2) help households identify new ways to incorporate typical purchase levels of produce into meals.** Approach 1 would yield an additional benefit of financial savings with households scaling purchases to match typical intake. However, it might risk impinging upon the consumption of fresh produce if an appearance of less produce in the kitchen induces less preparation of these items. Approach 2 risks creating more leftover waste if existing inventories are prepared but then not consumed, though it may also increase total consumption of fresh fruits and vegetables, which is likely to provide nutritional benefits.

Figure 3.8. Audited Waste as Food and Food Scraps: Volunteers and All Residents



Notes: The sample size for volunteers equals 229 and 181 for spring and summer, respectively. 'All' refers to route-level samples drawn from households who did not volunteer for the individual waste audits with one route sampled in each of the four research areas across Upper Arlington. Error bars represent 95% confidence intervals. *P*-values are from a *t*-test of the null hypothesis that spring and summer proportions are identical.

The question of whether the waste streams of audit takers are representative of the waste streams of other Upper Arlington residents can be observed in Figure 3.8, which reports the percent of the captured waste attributable to once edible wasted food and inedible food scraps from both those who volunteered for the curbside audit and from the route-level samples drawn

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from non-volunteers. Regardless of season or waste type, the route-level waste figures are not statistically different from the figures taken from the audits of the voluntary participants. For example, considering the first two bars in Figure 3.8, we find that in the Spring, about 14% of all waste in the audited samples of both the volunteers and the non-volunteers on their same route consisted of once edible food that was wasted.[3] Hence the comparison of the composition of waste types between the audits of volunteers and route-level samples suggests that the **food waste patterns observed among the volunteers is consistent with community-wide disposal trends**. We note that, consistent with Figure 3.5, the fraction of waste attributable to inedible food scraps declined by a statistically significant amount between spring and summer.

Another validation of the reduction of food scrap disposal from spring to summer as identified by the audit results can be found in Figure 3.9, which depicts trends in participation in Upper Arlington's household food waste drop-off composting program. The figure depicts about two years of bi-weekly (every other week) estimates of the number of households that participated and readings of total pounds of material collected.

Composting services were first offered to Upper Arlington residents during May of 2019 when two sites were opened that accepted food scraps dropped off by residents. The containers at these sites were emptied every other week. These first two sites faced capacity issues soon after they opened, with residents regularly finding the bins full, which discouraged resident participation. An additional site was added in August 2020, though the availability of the additional site was not widely promoted given the capacity issues faced elsewhere. Starting in February 2021, prior to the introduction of the SMTF campaign promotion, each site began to be serviced weekly (i.e., materials removed and sent to composting facility), which essentially doubled program capacity. However, there is no observable increase in the total amount of material handled through the program in February. Instead, both series feature **discrete increases in composting activity starting in April of 2021, which corresponds to the beginning of the intensive Save More Than Food campaign across Upper Arlington.**

This post-campaign uptick aligns with evidence from the Upper Arlington surveys. On the Spring and Summer survey, respondents were asked about their composting activities. The fraction reporting some type of composting activity increased from 50.4% in the Spring to 58.0% in the Summer, which is a statistically significant increase even when age and education are controlled for via regression. While the increases are greater among residents who received the intensive compost intervention (UA-FS+C), including offers of discounts on composting materials, the estimated treatment effect is not statistically significant.

[3] Recall, we cannot compare absolute levels of waste per person between volunteers and the remaining households because we have only a sample of the route waste. Constructing a per-person estimate of waste from all households would require weighing the entire truckload of waste from the route and dividing by the number of people represented by that route, which is information that is not available.

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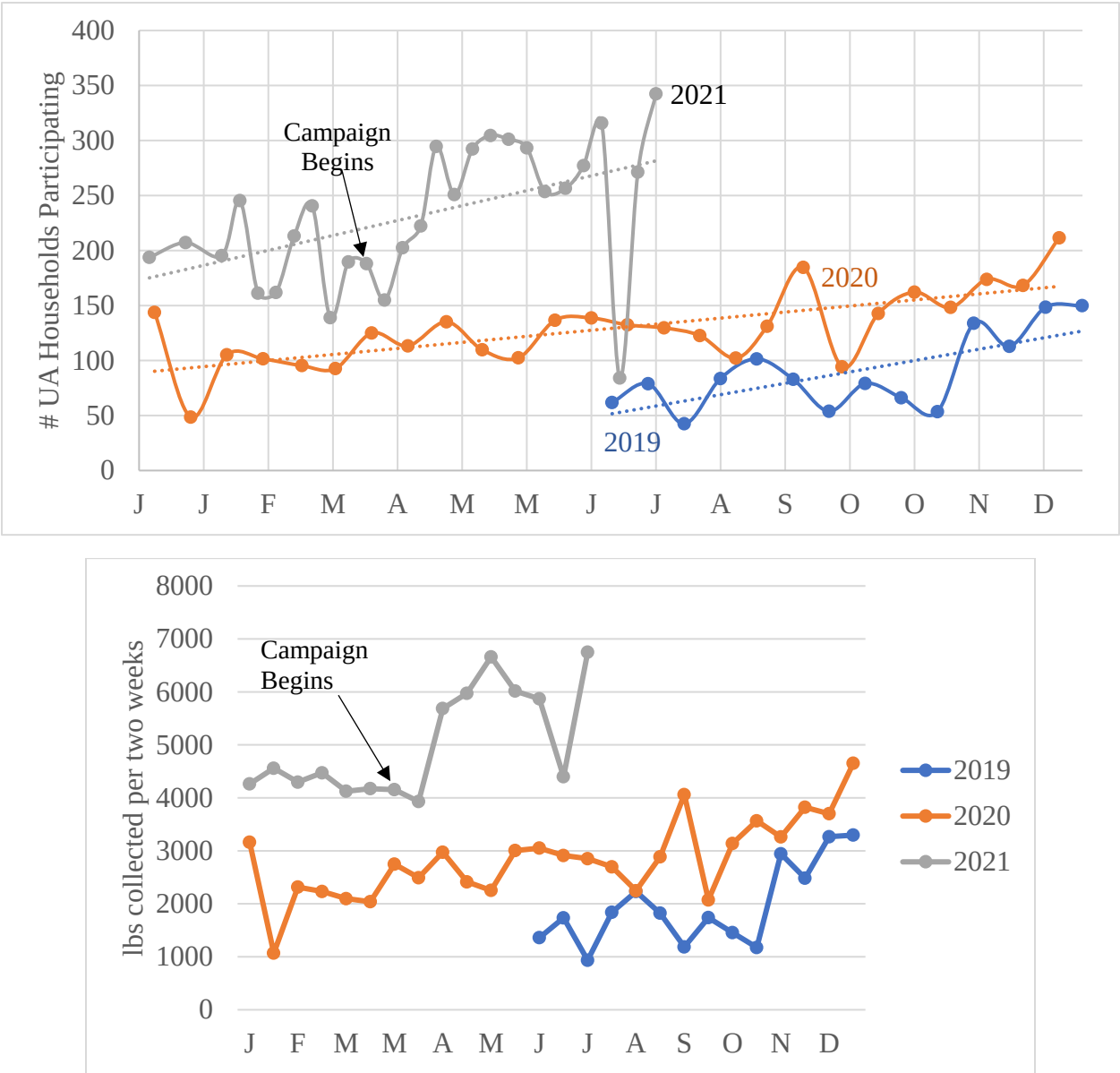
Figure 3.9. Participation in the Upper Arlington Drop Off Composting Program



Notes: Bi-weekly estimates of the number of households (top panel) and bi-weekly measures of total pounds of material collected (bottom panel) by year in Upper Arlington's community wide drop off compost program.

However, of those who reported composting on the Summer survey, 21.6% reported that they were either composting for the first time (13.8%) or had restarted composting after a hiatus (7.8%). This would reconcile with the Spring uptick in the amount of material contributed to the Upper Arlington drop off composting program in Figure 3.9.

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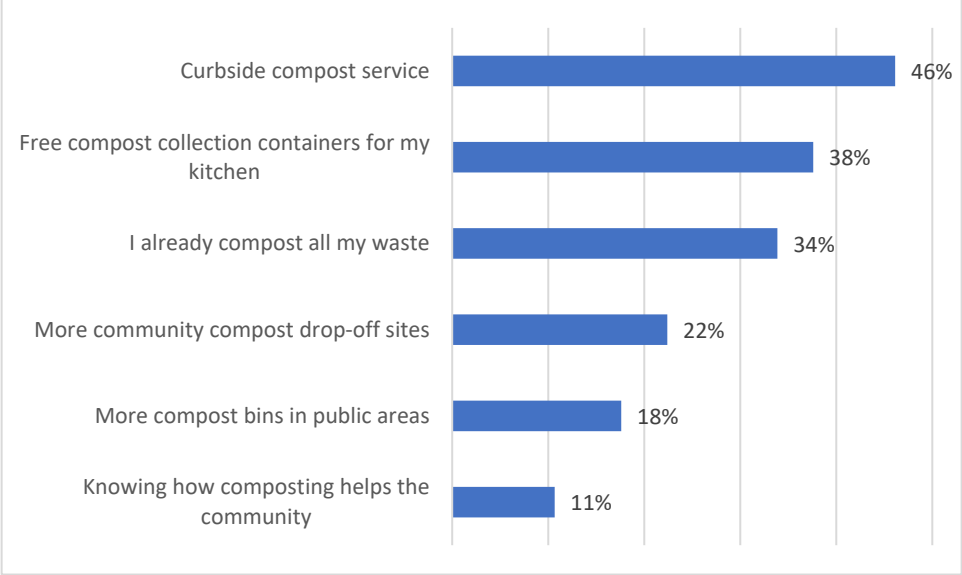
The Summer survey also prompted respondents to identify factors that would enable residents to compost more (Figure 3.10) and barriers that exist to increasing composting (Figure 3.11). The avenues identified as most likely to encourage more composting included the offering of curbside composting services (46% of responses), provision of free composting containers (38%) and the addition of more community sites for dropping off compost (22%). The greatest perceived barrier was a lack of knowledge about composting practices (40%), followed by a lack of equipment and supplies (24%), lack of time (15%) and the high cost (8%). About 11% identified 'other' barriers, which were largely idiosyncratic to the household (e.g., site specific issues) or expansion on other response options (e.g., statements that they see no barriers or that they don't create enough waste to justify composting or they need information on how to keep rats away). However, a full 30% of respondents said they do not see any barriers to composting for their households. **Hence, we conclude that expansion of composting activity in Upper Arlington could occur by following several paths, including educational programs to overcome knowledge barriers, curbside composting, subsidized compost bin provision, and expansion of composting collection sites, each entailing their own financial and logistical costs.**

Figure 3.10. Factors that would encourage Upper Arlington residents to compost more



Notes: N=376. Responses from summer survey only. Respondents could provide multiple responses so figures do not sum to 100%. Percentages correspond to percent of respondents who selected each response.

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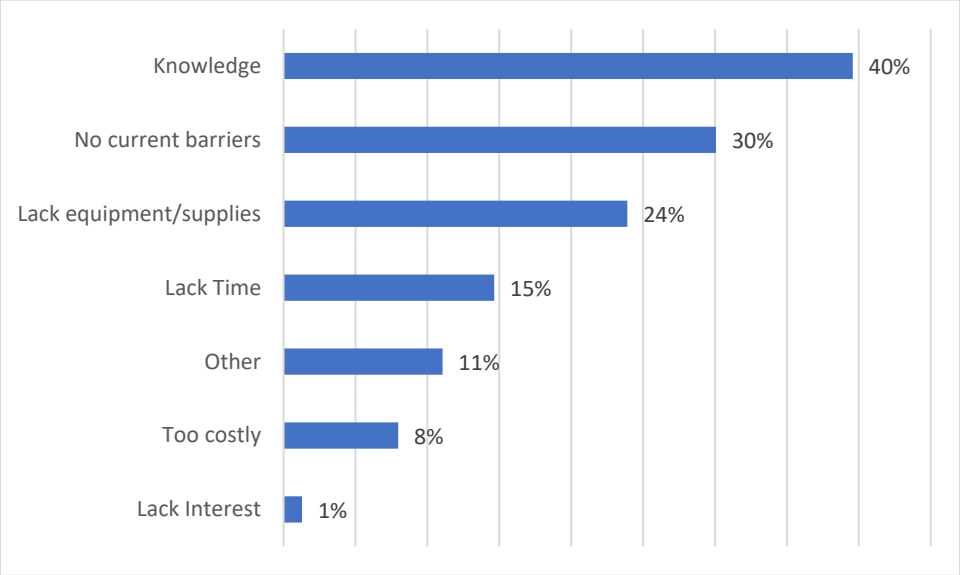
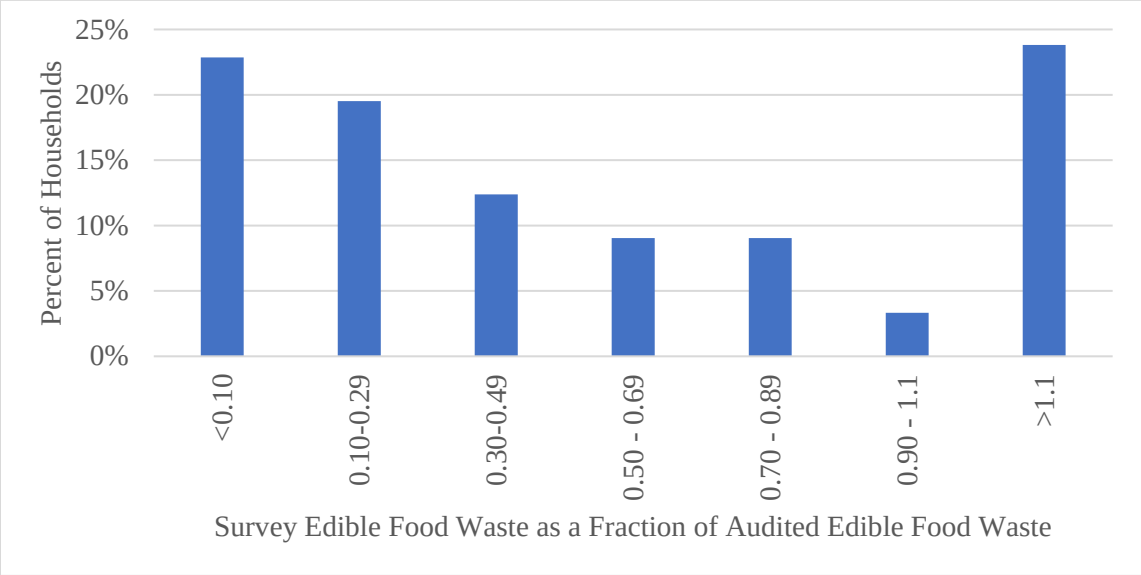
Figure 3.11. Perceived Barriers to Composting, Upper Arlington Respondents



Notes: N=389. Percent of respondents mentioning each barrier from summer survey only. Respondents could provide multiple responses so figures do not sum to 100%.

Figure 3.12. Survey edible waste as a fraction of audited edible waste



Notes: Percent of the 210 Upper Arlington households that recorded during the same period both survey and audit waste levels that fall into each category with values less than one indicating less waste reported via survey than audit. Audits (mean = 637.5 g/person) occurred several weeks after the week reported by survey (mean = 266.5 g/person).

We note that, like many other studies, we find that among households who report both survey and audit waste amounts, the amount of waste identified via audit is larger than the amount of waste identified via survey by about 2.4 times (mean = 637.5 g/person by audit and 266.5 by survey). However, Figure 3.12 shows considerable variability across households in the

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ratio of survey to audit figures with more than 20% reporting more waste via survey than audit. We note that this may occur because audits were conducted several weeks after the survey reporting period, hence if weekly patterns during the audit or survey deviated from long-run household averages, we might expect considerable variation in the ratio.

4. Discussion

The evaluation assesses how the SMTF campaign affected Upper Arlington residents on several fronts including campaign awareness, perceived campaign effectiveness, self-reported attitudes, knowledge, behaviors concerning the reduction and diversion of food waste, and observed amounts of food waste entering landfills and drop off composting sites. Table 4.1 summarizes key findings from the results. Assessments are conducted both in terms of simple changes in key constructs between pre-campaign and post-campaign measurements and in terms of treatment effects, where pre- vs. post-campaign measures are contrasted between treatment and control areas that received different levels of campaign and related intervention materials.

In terms of the Upper Arlington campaign itself, which is detailed in Section 2, we find a large and significant increase in respondents' general recall of the campaign regardless of whether they were in treatment or control areas and greater perceived campaign effectiveness among respondents in treatment versus control areas. However, key attitudes, knowledge and actions that support reductions in food waste prevention and diversion proved less pliable than campaign awareness. There were no statistically significant changes across 11 different food waste attitude prompts, 3 different food waste knowledge questions and 4 different pre-cursor action frequencies after the implementation of the campaign for all respondents, and only two attitude responses resulted in significantly different changes between the treatment and control areas. While the initial level of knowledge about food waste reduction practices was quite high and could plausibly leave little room for improvement after exposure to the SMTF materials (so called ceiling effects), the initial food waste attitude and practices responses were more in the middle of the response scale and, hence, did not suffer from a similar issue. Hence, **while more people became aware of the existence of the campaign, it did not seem to translate to changes to the cognitive pre-cursors to food waste reduction as captured by the survey**.

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Table 4.1. Summary of Campaign Effects

Outcome	Post-Campaign Change	Treatment Effect
Recall of SMTF campaign	++	none
Perceived Effectiveness of SMTF		
-Food waste as an important topic	nm	++
-Creating action to reduce food waste	nm	+
Attitudes about food waste	None	1 ++, 1 +, 9 None[A]
Food waste reduction and compost knowledge	None	None
Food waste prevention precursor actions	None	None
Household food waste creation behavior		
-self-reported waste of edible	- -	
- vs. Upper Arlington control		None
- vs. National control		- -
-audit of edible + inedible food waste	None	None
-audit of inedible	- -	None
-audit of edible	None	None
-fraction of route audit as edible	None	nm
-fraction of route audit as inedible	- -	nm
Composting behaviors		
-self-reported composting activity	++	None
-community drop off program amount	++	nm

Notes: Post-Campaign Change refers to tests that summer responses differed from spring responses. Treatment Effect refers to changes from spring to summer in treatment areas compared to changes in control areas. ++ (- -) denotes an increase (decrease) that was statistically significant, + (-) denotes an increase (decrease) that was marginally statistically significant, 'None' denotes the change was not statistically significant, 'nm' denotes not measured. [A] There were 11 responses under 'Attitudes about food waste', 3 responses under Food waste reduction and compost knowledge and 4 responses under Food waste prevention precursor actions; see Tables 3.3 – 3.5 for details.

While the campaign's effect on respondents' cognitive and antecedent behaviors was somewhat limited, the campaign does yield several significant changes in the amount of food that is wasted and the amount of wasted food and food scraps that are diverted from landfill. Self reported edible food waste declined by 23% (a statistically significant amount) across all areas within Upper Arlington. While there is no statistically significant difference in this decline between control and treatment areas within Upper Arlington, these declines, which contrast with a large significant increase (29%) reported by a national sample of respondents to a parallel survey, yield a statistically significant treatment effect when using the entirety of Upper Arlington as the treatment group and the national sample as the control.

This decline in self-reported waste generation is corroborated with statistically significant reductions in the amount of total food waste measured among households that volunteered for curbside waste audits (21%, statistically insignificant) which consisted of a statistically significant 30% reduction for inedible food scraps and a statistically insignificant 17% reduction among once-edible food. There was also a statistically significant decline in the fraction of the waste stream from samples of non-volunteering households' waste that was classified as inedible food scraps. This also corresponds to a statistically significant increase in

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reported composting activity reported by survey respondents. As with the self-reported food waste figures, neither the audit results nor the self-reported composting activity results feature statistically significant differences between treatment and control areas.

The absolute levels of decline in waste (23% on the survey, 21% on the audit) are comparable or slightly smaller than those reported in similar types of campaigns in North America and Europe. For example, Van der Werf et al. (2019) report a 31% decline in total curbside food waste after the "Reduce Food Waste, Save Money" campaign was deployed in London, Ontario, Canada. In Italy, Romani et al. (2018) deployed a campaign where the treatment group received information on the importance of meal planning and a meal planning tool. The result, as assessed via weighed food-waste diaries, was a significant (24%) reduction in waste relative to the control group one week following the intervention compared with a control group. In a contrasting Canadian study, Soma et al. (2020) found no significant change in audited waste amounts after deploying a campaign that involved similar types of information and community meetings as those deployed in Upper Arlington.

The decreases in audited inedible food scraps and self-reported composting activities also corresponds with a marked increase in the amount of material collected through Upper Arlington's drop-off composting program, which expanded its capacity to receive compostable materials prior to the Upper Arlington campaign but did not see increases in participation and material flow until after the campaign began. Indeed, many summer survey respondents noted that during the previous few months that they either began composting or returned to composting after a considerable hiatus.

5. Recommendations

Review of the results and discussion yield several recommendations relevant for a variety of audiences. We share several of these below.

1. **Implement and/or continue supporting community level implementation of the Save More Than Food campaign.** (*Audiences*: Upper Arlington and other Central Ohio communities)

The implementation of the SMTF campaign in Upper Arlington resulted in several desirable outcomes including reduced generation of wasted food, reduced landfilling of inedible food scraps, and increased participation in composting. While other central Ohio communities may be distinct from Upper Arlington in terms of residents' demographic profile and existing community support for food waste reduction and diversion, the campaign holds potential to increase awareness and stimulate behavioral change.

2. **Deploy the campaign through trusted community actors and their communication channels.** (*Audiences*: communities)

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In the case of Upper Arlington, the community newsletter, mailed and e-mailed materials featuring the city's explicit endorsement, and the community's social media accounts were among the most frequently reported sources when respondents were asked how they heard about the campaign, while paid television and internet advertisements were infrequently mentioned. Leveraging trusted community actors and their established communication channels may help respondents feel comfortable that the campaign aligns with community goals and the community can more easily maintain the campaign to ensure participation and solidify behavioral change. Known community communications channels may also be less expensive than paid advertising but may not be available in every community.

3. **Develop and deliver campaign materials that focus on changing behavior recognizing interventions need not always involve changing awareness, knowledge or attitudes.** (*Audience*: communities, food waste intervention developers)

Contrary to common belief, changing attitudes or knowledge about a topic is not always a necessary step for shifting behavior. Providing simple and convenient solutions or nudges can be enough to influence resident behavior especially if there is a pre-existing positive sentiment about the new behavior. While Upper Arlington residents' attitudes and knowledge about wasted food and composting did not significantly change in response to the Save More Than Food Campaign, the amount of wasted food generated in UA households decreased significantly and community food waste drop off sites saw a significant increase in use.

4. **If the campaign seeks to increase food waste diversion activity, ensure sufficient capacity exists to meet increased demand.** (*Audiences*: communities, policy makers)

In the case of Upper Arlington, the municipal composting system consists of several drop-off locations around the community that had previously suffered capacity limits due to less frequent (every-other week) removals of collected materials. About a month prior to the campaign, which encouraged households to compost, pick up frequency increased to a weekly schedule. This reduced the chances that new and returning composters were frustrated by finding full collection bins after going through the effort of separating compostable materials from their household waste streams and transporting it to the pickup sites. Likewise, the campaign also featured education and subsidized materials for supporting home composting to capitalize on those households who became energized by the campaign to pursue home composting options. Looking forward, the survey results suggest that further expansion of household food waste composting will require commitments beyond the simple provision of composting information, such as the provision of curbside composting service or free compost collection containers, that entail significant financial and/or logistical costs.

5. **Consider your community's traits when prioritizing between food waste reduction and diversion efforts.** (*Audiences*: communities)

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Reduction activities must be applied in concert with composting activities in order to ensure the sustainable management of the nutrients and energy embodied in uneaten food and food scraps. With an integrated whole systemic reduction-diversion approach as the goal, practitioners may at first, opt to pursue one avenue or the other based on community characteristics. For example, a broad-sweeping consumer campaign on food waste reduction may be a logical choice in locales that are able to coordinate messaging across strong local networks of community organizations or for cities that don't have any infrastructure to handle food waste. In another locale, addressing infrastructure for food scrap composting may be a more obvious choice if the region has an experienced workforce and existing compost and mulching operations that can adapt to accepting food scraps. Momentum from any activity around food waste, whether prevention or recycling focused, can and ought to be leveraged to build public and political support for greater investment for additional food waste activities.

6. **Focus behavior change efforts on the purchase and use of fresh produce.** (*Audiences*: communities, policy makers)

Whether measured by audit or survey, fruits and vegetables proved to be the dominant fraction of all food wasted whereas the more expensive and energy-dense items, such as meat, fish, dairy and eggs, were much smaller fractions of overall waste. The dominance of produce in the wasted food mix is a finding that is common to other studies as well (Hoover and Moreno 2017, WRAP Quested et al. 2011). Limiting the focus to a single product category can also sharpen the types of advice and interventions offered and provide a focus to targeted households that can make the task of altering behavior seem more manageable. More research is needed to help individual communities choose between two produce waste reduction strategies: (1) help households purchase less produce such that purchases match final use (e.g., better meal planning) and/or (2) help households identify new or more effective ways to incorporate typical purchase levels of produce into meals (e.g., better storage, novel recipe adoption). Approach 1 would yield an additional benefit of financial savings with households scaling purchases to match typical intake. However, it might risk impinging upon the consumption of fresh produce if an appearance of less produce in the kitchen induces less preparation of these items. Approach 2 risks creating more leftover waste if existing inventories are prepared but then not consumed, though it may also increase total consumption of fresh fruits and vegetables, which is likely to provide nutritional benefits. We conclude by noting some emerging evidence that the most wasted food category may differ by community. For example, communities with limited access to fresh produce may waste few fruits and vegetables, which underlines the need for local assessments to focus campaigns on categories that are locally relevant.

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7. **Prioritize research to reduce respondent survey burden.** (*Audiences*: researchers, funding agencies)

Current best practice for assessing household food waste via survey is to implement a two-wave survey in which respondents are instructed in the first wave to monitor their food discard patterns in preparation for a follow up survey to arrive one week later where they can report what was discarded across 24 distinct categories (van Herpen et al. 2019). In our study we found 22% responded to the first wave but not the second wave. The surveys used in Upper Arlington to took the median respondent between 13 and 15 minutes to complete. A shorter survey may have increased the response rates. Research that can improve the accuracy of single wave food waste assessment surveys could broaden the participation across communities and provide more accurate assessment of campaign efficacy. If campaigns follow Recommendation 6 and focus on produce only, this may facilitate creating less burdensome survey instruments.

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7. Appendices

7.1 Food Waste Attitude Awareness and Behavior Surveys

The following two rounds of surveys were utilized in the study to evaluate residents' awareness, attitudes, and behaviors arounds food waste. The first survey, referred to as the Opening Survey, was deployed in February 2020 to establish a foundation of residents' behavior before exposure the Save More Than Food. The second survey, referred to as the Closing Survey, was deployed in June 2020 to evaluate the level of change in residents knowledge, attitude and awareness about food waste as a result of Save More Than Food engagement efforts.

7.1.1. Opening Survey

As described in section 2.3.1, the opening survey was divided into two parts, which were deployed 7 days apart from each other.

7.1.1.1 Opening Survey Part 1: Baseline Survey

Start of Block: Welcome Block

Q31 On behalf of the City of Upper Arlington, Ohio State University and the Solid Waste Authority of Central Ohio (SWACO), thanks for agreeing to participate.

Please click through to start the survey.

End of Block: Welcome Block

Start of Block: Screener Block

Q1 Thinking about all the meals that are prepared in your home, do you prepare ...? Select one.

- Less than half (1)
- About half (2)
- More than half (3)

Q23 Which of the following categories best describes your age? Select one.

- Under 18 (1)
- 18-24 (2)
- 25-34 (3)
- 35-44 (4)
- 45-54 (5)
- 55-64 (6)
- 65 and older (7)

End of Block: Screener Block

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Start of Block: Consent Block

Q4 Researchers from The Ohio State University would like to ask you some questions about food in your home and questions about you and your household. These questions are being asked by Professor Brian Roe of Ohio State University and will take about 5 minutes to answer. You will also be eligible to complete a follow up survey should you choose to complete the first survey. The follow up survey would be available about one week after the completion of this survey and would take about 15-20 minutes to complete.

The survey requires you to complete both multiple choice and open ended (write in) questions. Open ended questions should require brief responses, but the length of the response is up to you. This study does not require the study coordinator to access any of your personal information. Your de-identified information may be used or shared with other researchers without your additional informed consent. Information provided to this study does not have the potential to damage your financial standing, employability or reputation, or place you at risk of criminal or civil liability. We will work to make sure that no one sees your survey responses without approval. But, because we are using the Internet, there is a chance that someone could access your online responses without permission. In some cases, this information could be used to identify you.

Your participation is voluntary and you may skip any question or request for any reason. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may choose to stop participating at any time without penalty or loss of benefits to which you are otherwise entitled. There are no direct benefits to you from participating. You can choose to receive information about how your responses compare to average responses of other participants.

If you have questions about the survey you may contact Brian Roe at 614-688-5777. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Do you consent to participate?

- o Yes (1)
- o No (2)

End of Block: Consent Block

Start of Block: Demographics Block

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Q5 **Demographics Module**

Q6 Are you…? Select one.

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to answer (3)

Q7 Are you Hispanic or Latino? Select one.

- ○ Yes (1)
- ○ No (2)
- ○ Prefer not to answer (3)

Q8 What is your race? Select all that apply.

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ Asian (3)
- ☐ Native Hawaiian or other Pacific Islander (4)
- ☐ American Indian or Alaskan Native (5)
- ☐ Some other race (6)
- ☐ ⊗Prefer not to answer (7)

Q9 What is the highest grade or level of school you have completed? Select one.

- ○ Less than 12th grade, NO DIPLOMA (1)
- ○ High school graduate, DIPLOMA or GED (2)
- ○ Some college or Associate degree (3)
- ○ Bachelor's degree (4)
- ○ Graduate or professional degree (5)

Q21 How many people live in your household as of today? Select one.

	Today
Children 0-5 years of age (1)	▼ 0 (1 ... 10 (11)
Children 6-17 years of age (2)	▼ 0 (1 ... 10 (11)
Male adults 18 years or older (3)	▼ 0 (1 ... 10 (11)
Female adults 18 years or older (4)	▼ 0 (1 ... 10 (11)

Q22 How would you best describe your employment situation? Select one.

- ○ Full time employment (35 hours a week or more) (1)
- ○ Part time employment (less than 35 hours a week) (2)

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- Unemployed (3)
- Student (4)
- Retired (5)
- Unable to Work (6)

Q10 Which of the following categories best describes your annual household income before taxes during 2019? Select one.

- Less than $10,000 (1)
- $10,000 - $19,999 (2)
- $20,000 - $29,999 (3)
- $30,000 - $39,999 (4)
- $40,000 - $49,999 (5)
- $50,000 - $59,999 (6)
- $60,000 - $69,999 (7)
- $70,000 - $79,999 (8)
- $80,000 - $89,999 (9)
- $90,000 - $99,999 (10)
- $100,000 - $124,999 (11)
- $125,000 - $149,999 (12)
- $150,000 and above (13)
- Prefer not to answer (14)

Q23
About how often do you go grocery shopping? Do not consider occasions where a few items are obtained because they were forgotten the previous time you got groceries. *Select one*.

- Twice a week or more (1)
- Once a week (2)
- 2-3 times a month (3)
- once a month or less often (4)

Q24 What day of the week is your trash collected in Upper Arlington?

- Monday (1)
- Tuesday (2)
- Wednesday (3)
- Thursday (4)
- Friday (5)

End of Block: Demographics Block

Start of Block: Next Survey Preparation Instructions

Q17 Please read the next part carefully.

In about one week we will send you a follow up survey. For the next 7 days please

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pay close attention to the food and drinks you use in your home In particular, please pay attention to the amounts of different foods that you throw away because they are past date, spoiled or are no longer wanted for other reasons Do not worry about tracking items that you normally would not eat, such as bones, peels, shells, etc.
Question: What will you pay attention to for the next 7 days?

- The amounts of different foods that are thrown away at home because they are past date, spoiled or are no longer wanted for other reasons (1)
- Bones, peels, shells, etc (2)

End of Block: Next Survey Preparation Instructions

Start of Block: End of survey

Q25 Please enter an e-mail address where we should send the link to the follow up survey

- E-mail address (1) _____

Q22 Please re-enter the e-mail address below

- E-mail address (1) _____

Q26 Would you like to receive a report that compares your responses to those of the average Upper Arlington and average national household?

- Yes (1)
- No (2)

Q29 We are interested in understanding how closely the survey responses you will provide during next week's follow up survey match the amounts of food that end up in the garbage that is collected from individual homes. Comparing your responses to next week's survey to the amount of food that ends up in the garbage would help assess the accuracy of the follow up survey.

If you provide us with your street address, we may: Compare the amount of food waste in your garbage to your responses to next week's survey Note: just like all your responses to this survey, personal information will not be shared
If you agree, please enter your address below.

- Address Line 1 (1) _____
- Address Line 2 (2) _____
- City (3) _____
- State (4) _____
- Zip Code (5) _____

End of Block: End of survey

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7.1.1.2 Opening Survey Part 2: Follow-up

Start of Block: Introduction

Q1 Last week you were asked to pay close attention to the food and drinks you discard in your home.

This questionnaire **will** be about: All edible food and drink products that were spoiled, past their expiration date or otherwise unwanted that you discarded or composted in the past 7 days.

Please include it whether you threw the food away in a trash can, garbage disposal, compost heap or gave it to an animal (pet, birds, et cetera), or otherwise. Please include it all.

It will **not** be about: Bones, peels, seeds, stumps or similar things that you never typically eat.

Food and drink products that are thrown away when eating in a restaurant or cafeteria.

End of Block: Introduction

Start of Block: Questionnaire 1

Q2 Please mark the products that were discarded in your household in the past 7 days. In cases where items have several major ingredients, please report each ingredient separately. ***Select all that apply***

- ▢ Fresh vegetables and salads (1)
- ▢ Other vegetables (jar / canned / frozen) (2)
- ▢ Fresh fruit (3)
- ▢ Other fruit (jar / canned / dried / frozen) (4)
- ▢ Potatoes (5)
- ▢ Potato products (fries, hash browns, etc. - report potato chips under 'salty snacks') (6)
- ▢ Pasta (7)
- ▢ Rice and other grains (including wraps, couscous, etc.) (8)
- ▢ Beans, lentils, chickpeas, etc. (9)
- ▢ Meat (please report deli meat under 'sandwich ingredients') (10)
- ▢ Meatless Alternatives (11)
- ▢ Fish (12)
- ▢ Sandwich ingredients (deli meats, cheese slices, relishes, etc., but report lettuce and vegetables under 'fresh vegetables and salads') (13)
- ▢ Bread (14)
- ▢ Cereals (breakfast cereal, corn meal, oats, etc.) (15)
- ▢ Yogurt, custard, etc. (16)
- ▢ Cheese (report cheese slices under 'Sandwich ingredients') (17)
- ▢ Eggs (18)
- ▢ Soups / stews (19)
- ▢ Condiments and sauces (ketchup, mayonnaise, cocktail sauce, etc.) (20)

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- ☐ Candy / cookies / granola bars / chocolate bars (21)
- ☐ Salty snacks (chips / nuts / pretzels, etc) (22)
- ☐ Non-alcoholic beverages (milk, juice, soda. Exclude: water, tea, coffee) (23)
- ☐ Alcoholic beverages (24)
- ☐ ⊗I have not thrown away any food or drink products (25)

End of Block: Questionnaire 1

Start of Block: Events

Q60 In the past 7 days, which of the following issues in your household may have affected the amount of food that you threw away or composted? (Mark all that apply).

- ☐ Had unexpected guests for a meal (1)
- ☐ Guests expected for a meal unexpectedly did not attend (2)
- ☐ Ate out unexpectedly rather than eating meal(s) at home (3)
- ☐ Received food that was not as fresh or as high quality as normal (4)
- ☐ Hosted an event involving food (5)
- ☐ Tried a new recipe or had a recipe not work as expected (6)
- ☐ Fewer meals at home than typical (8)
- ☐ Expired/excessive items from bulk or batch shopping in warehouse clubs (Costco, Sam's Club, etc.) (10)
- ☐ Another issue not mentioned above occurred that affected the amount of food that was thrown away (7)
- ☐ ⊗None of the above (9)

Q61 You marked that other issues not mentioned in previous question affected the amount of food that was thrown away in the past 7 days. Please briefly describe the issue(s).

Q59 Compared to the last two months, would you say the past 7 days you threw away...

A lot less food than normal	A little less than normal	About the same amount of food as normal	A little more than normal	A lot more food than normal

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	-2	-1	0	1	2
()					

Q61 During the past 7 days, what percent of your daily non-sleeping time (including any paid work, school and socializing) was spent in your home?

	0	10	20	30	40	50	60	70	80	90	100
1 ()											

Q62 During the past 7 days, what percent of your meals have been home-prepared meals?

	0	10	20	30	40	50	60	70	80	90	100
1 ()											

Q106 How often do you compost inedible food scraps and food that you do not eat?

	Never	Some of the time	Most of the time	Always
	0	1	2	3
()				

End of Block: Events

Start of Block: Food Waste Knowledge and Effort

Q65 How would you rate your knowledge of what foods can and cannot be composted?

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	No knowledge at all	Somewhat knowledgeable	Very knowledgeable
	-2 -1 0 1 2		
()			

Q66 How would you rate your knowledge of how to best store your foods to maximize their freshness?

	No knowledge at all	Somewhat knowledgeable	Very knowledgeable
	-2 -1 0 1 2		
()			

Q67 How would you rate your knowledge of food waste prevention tactics including meal planning and prepping, sticking to your meal plan, etc.

	No knowledge at all	Somewhat knowledgeable	Very knowledgeable
	-2 -1 0 1 2		
()			

End of Block: Food Waste Knowledge and Effort

Start of Block: Attitudes

Q68 If you further reduced food waste, would it cost you money or save you money?

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	Cost a lot	Cost a little	No change	Save a little	Save a lot
	-2	-1	0	1	2
()					

Q69 To what extent would you agree with the following statements about food that is thrown away in your home?

Options:

Disagree strongly (1)	Disagree somewhat (2)	Agree somewhat (3)	Agree strongly (4)

Statements:

Throwing away food is bad for the environment (1)

You throw away food if the package date has passed (2)

You feel guilty when you throw away food (3)

You don't have enough time to worry about the amount of food you waste (4)

Some food waste is necessary to make sure meals taste fresh and good (5)

It would be difficult to reduce your household's food waste any further (6)

You waste more food when you buy things in large packages or when you buy in large quantities during a sale (7)

Your household wastes more food than other households of similar size (8)

You should make an effort to reduce food waste when possible (9)

Your actions to reduce food waste make a positive difference for your family (10)

Your actions to reduce food waste make a positive difference for your community (11)

End of Block: Attitudes

Start of Block: Diversion Actions

Q75 Which of the following food waste **prevention** actions have you taken in the past 30 days? (check all that apply)

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- ☐ Shopped with a list to avoid impulse buys (1)
- ☐ Created a meal plan (2)
- ☐ Properly stored food to maximize freshness (3)
- ☐ Watched a SWACO webinar about food waste prevention (4)
- ☐ Purchased bruised or discounted food items (5)
- ☐ Other (please specify) (6)
- ☐ ⊗None (9)

Q76 What other food waste prevention actions have you taken in the past 30 days?

Q77 How often did you shop with a list?

- ○ Tried it once (1)
- ○ Occasionally (2)
- ○ Regularly (3)
- ○ Every time (4)

Q78 How often did you create meal plans?

- ○ Tried it once (1)
- ○ Occasionally (2)
- ○ Regularly (3)
- ○ Every time (4)

Q79 How often did you properly store food items to maximize freshness?

- ○ Tried it once (1)
- ○ Occasionally (2)
- ○ Regularly (3)
- ○ Every time (4)

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Q80 How often did you eat bruised or discounted food items?

- ○ Tried it once (1)
- ○ Occasionally (2)
- ○ Regularly (3)
- ○ Every time (4)

Q87 What would make you prevent food waste more? (select all that apply)

- ☐ Know how to divert food waste (1)
- ☐ Incentives for reducing food waste (2)
- ☐ Knowing how food waste prevention saves me money (3)
- ☐ Knowing how food waste prevention helps the community (6)
- ☐ Knowing how food waste prevention helps feed those in need (4)
- ☐ Knowing how food waste prevention helps the environment (5)
- ☐ Other (Please specify) (8)
- ☐ ⊗None of the above (7)

Q98 What other method(s) would make you prevent food waste more?

Q81 Which of the following food waste **recovery** actions have you taken in the past 7 days? (select all that apply)

- ☐ Ate leftovers (1)
- ☐ Remade leftovers into a new recipe (2)
- ☐ Froze food to prevent it from going bad (3)
- ☐ Donated excess unopened food items (4)
- ☐ Shared excess prepared food with others outside my household (5)
- ☐ Fed food scraps to pets (6)
- ☐ Other (please specify) (7)
- ☐ ⊗None (8)

Q84 What other food waste recovery actions have you taken in the past 30 days?

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Q82 Have you taken any of the following actions to avoid throwing away or landfilling food in the past 30 days? (select all that apply)

- ▢ Composted food scraps in your back yard (1)
- ▢ Composted food scraps at a community drop-off location (2)
- ▢ Composted food scraps through a subscription service (3)
- ▢ Applied for a backyard composting equipment rebate through the Franklin Soil and Water Conservation District (4)
- ▢ Other(please specify) (5)
- ▢ ⊗None (6)

Q83 What other actions have you taken to avoid throwing away or landfilling food in the past 30 days?

Q86 Which, if any, of the following incentives would cause you to try out composting? (select all that apply)

- ▢ Rebate on backyard composting equipment (1)
- ▢ Training resources/tutorials on getting started with backyard composting (2)
- ▢ Access to curbside food waste collection program (3)

Q88 What would make you compost your food waste more? (select all that apply)

- ▢ More community compost drop-off sites (1)
- ▢ More compost bins in public areas (2)
- ▢ Curbside compost service (3)
- ▢ Knowing how composting helps the community (4)
- ▢ Free compost collection containers for my kitchen (5)
- ▢ ⊗I already compost all my waste (6)

Q85 What barriers keep you from participating in other food waste diversion activities? (select all that apply)

- ▢ I don't know how to participate (1)
- ▢ I need additional tools/equipment to participate (2)
- ▢ It costs money to participate (3)
- ▢ It takes too much time to participate (4)

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- ☐ I am not interested in food waste diversion (5)
- ☐ Other (please specify) (6)
- ☐ ⊗None (7)

Q107 What are the other barriers that keep you from participating in other food waste diversion activities?

End of Block: Diversion Actions

Start of Block: Messaging

Q70 Reducing food waste conserves resources in Central Ohio. Rate the following resources savings related to reducing food waste in terms of their importance to you.

Q71 Global Environmental Resource conservation: Reducing greenhouse gases, Increasing global biodiversity and ecosystem health

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
	-2	-1	0	1	2
()					

Q72 Local Environmental Resource Conservation: Farmland use, Air pollution, Soil erosion, Water pollution

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
	-2	-1	0	1	2

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Q73 Economic Loss: Personal financial savings, Local job creation, Economic improvement

Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
-2	-1	0	1	2

()	

Q74 Opportunity to Support the Community: Provide meals for local food insecure residents

Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
-2	-1	0	1	2

()	

Q102 For the next few questions, please consider each statement. Then, use the slider to choose how likely it is that the statement would encourage you to take action to reduce the amount of food that you discard.

Q97 Each year, Franklin County residents waste 160,000 acres of land used to produce food that is never eaten. That's roughly half the landmass of Franklin County.

Very Unlikely	Somewhat Unikely	Neutral	Somewhat Likely	Very Likely

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	-2	-1	0	1	2
()					

Q98 Each resident in Franklin County wastes more than 30 gallons of water a year on food that is produced but never eaten.

	Very Unlikely	Somewhat Unikely	Neutral	Somewhat Likely	Very Likely
	-2	-1	0	1	2
()					

Q99 Every year, the average family of four wastes $1,500 on food that is purchased but never eaten.

	Very Unlikely	Somewhat Unikely	Neutral	Somewhat Likely	Very Likely
	-2	-1	0	1	2
()					

Q100 When food is wasted in Central Ohio, all the energy and fuel used to grow, harvest and transport it is lost.

	Very Unlikely	Somewhat Unikely	Neutral	Somewhat Likely	Very Likely
	-2	-1	0	1	2

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()	

Q101 For every meal missed by struggling neighbors in our community, three potential meals are sent to the landfill.

Very Unlikely	Somewhat Unikely	Neutral	Somewhat Likely	Very Likely
-2	-1	0	1	2

()	

End of Block: Messaging

Start of Block: Campaign Exposure

Q90 In the past 12 months, outside of this survey, have you read, seen or heard anything about the amount of food that is wasted or about ways to reduce the amount of food that is wasted?

- Yes (1)
- No (2)
- Not sure (3)

Q93 Where would you currently look to answer questions about how to reduce food waste?

- ☐ Google search (1)
- ☐ Government/municipal/community website (2)
- ☐ Grocery store/food business website (3)
- ☐ Save More Than Food Mail resources (4)
- ☐ Save More Than Food website (5)
- ☐ Other (please specify) (7)
- ☐ ⊗None of the above (6)

Q94 What other channels do you utilize to answer questions about how to reduce food waste?

Q91 In the past 30 days, do you recall seeing or hearing about the "Save More Than Food" campaign?

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- Yes (1)
- No (2)

Q92 Which of the following ways do you recall seeing or hearing about the "Save More Than Food" campaign?

- ☐ Facebook (1)
- ☐ Twitter (2)
- ☐ LinkedIn (3)
- ☐ Instagram (4)
- ☐ Community newsletter (5)
- ☐ Internet search (6)
- ☐ Television (7)
- ☐ Online advertisement (8)
- ☐ Printed flyer (9)
- ☐ Mailed materials (physical mailbox) (10)
- ☐ Emailed materials (11)
- ☐ Word of mouth (12)
- ☐ Not sure (14)
- ☐ ⊗None of these (13)

End of Block: Campaign Exposure

Start of Block: End of survey

Q103 Please enter the e-mail address from which you gained access to this follow-up survey

- E-mail Address (1) _____

Q104 Please re-enter the e-mail address below

- E-mail Address (1) _____

End of Block: End of survey

Start of Block: Instruction for the next part of the questionnaire

Q3

Types of Food Waste We split food waste into several categories, which are explained below. Please read this carefully as these categories will be used in the next questions. Completely unused foods: food that is disposed of which has not been used at all. For instance, unopened packages, including unopened parts of multipacks. Partly used foods: food that is disposed of

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after being partly used. For instance, a few bread slices, half a package of deli meat, half an onion or half a package of milk. Meal leftovers: leftovers that are disposed of after being left on the plate, pots or pans. For instance, mashed potatoes or rice that is left on the plate or in the pan, sandwiches that were not eaten during lunch. Leftover after storing: meal leftovers that are disposed of after being stored in the fridge or freezer to be eaten later. For instance, leftover lasagna that was frozen but never eaten.

Q4 There will be several questions about different types of food and drink products you have disposed of in the past 7 days. First, we ask how much of a certain product your household disposed of in the past 7 days. Use the following as a guide: Next, we ask to which type the majority of that discarded food item belongs (unused, partly used, meal leftovers, leftover after it was stored). Please pay attention to which food product it refers to!

End of Block: Instruction for the next part of the questionnaire

Start of Block: Questionnaire 2 Fresh vegetables and salads

Q5 In your household, how many **fresh vegetables and salads** were disposed of in the past 7 days? This will include any lettuce or vegetables used as sandwich ingredients.

- less than 1 cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)
- 5 to 6 cups (4)
- More than 6 cups (5)

Q6 To which category did the (majority of) the disposed of **fresh vegetables and salads** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., a leek) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Fresh vegetables and salads

Start of Block: Questionnaire 2 non-fresh vegetables (jar/ canned / frozen)

Q7 In your household, how many **other vegetables (jar/ canned / frozen)** were disposed of in the past 7 days?

- less than 1 cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)

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- 5 to 6 cups (4)
- More than 6 cups (5)

Q8 To which category did the (majority of) the disposed of other vegetables (jar/ canned / frozen) belong? *Please mark the category that occurred the most. You can tick more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., unopened frozen / canned spinach package) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half used frozen / canned spinach package) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 non-fresh vegetables (jar/ canned / frozen)

Start of Block: Questionnaire 2 fresh fruit

Q9 In your household, how much **fresh fruit** was disposed of in the past 7 days? *(One apple or banana is one piece of fruit. In case of small fruits, such as strawberries or grapes, one small bowl of about 5 ounces is considered 'one piece')*

- Approximately one fourth of a piece of fruit or less (1)
- Approximately half a piece of fruit (2)
- Approximately 1 piece of fruit (3)
- 2 to 4 pieces of fruit (4)
- More than 4 pieces of fruit (5)

Q10 To which category did the (majority of) the disposed of fresh fruit belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., an apple) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half an apple that is not used in a dish) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (e.g., half eaten apple or a fruit salad) (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (e.g. fruit salad after it was stored) (4)

End of Block: Questionnaire 2 fresh fruit

Start of Block: Questionnaire 2 non-fresh fruit (jar / canned / dried / frozen)

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Q11 In your household, how much **other fruit (jar / canned / dried / frozen)** was disposed of in the past 7 days? *(One apple or banana is one piece of fruit. In case of small fruits, such as strawberries or grapes, one small bowl of about 5 ounces is considered 'one piece')*

- Approximately one fourth of a piece of fruit or less (1)
- Approximately half a piece of fruit (2)
- Approximately 1 piece of fruit (3)
- 2 to 4 pieces of fruit (4)
- More than 4 pieces of fruit (5)

Q12 To which category did the (majority of) the disposed of other fruit belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., unopened fruit can) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half full fruit can) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (e.g., bowl with fruit) (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (e.g. fruit salad after it was stored) (4)

End of Block: Questionnaire 2 non-fresh fruit (jar / canned / dried / frozen)

Start of Block: Questionnaire 2 potatoes

Q13 In your household, how many **potatoes** were disposed of in the past 7 days?

- less than 1 cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)
- 5 to 6 cups (4)
- More than 6 cups (5)

Q14 To which category did the (majority of) the disposed of potatoes belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete potato package) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a potato package) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (e.g. mashed potato) (3)

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- ▢ Leftovers after storing: Meal leftovers that are disposed of after these were stored (e.g. mashed potato after it was stored) (4)

End of Block: Questionnaire 2 potatoes

Start of Block: Questionnaire 2 potato products (fries, hash browns, etc.)

Q15 In your household, how many **potato products (fries, hash browns, etc.)** were disposed of in the past 7 days? Please consider potato chips under 'salty snacks.'

- o Less than 1 cup (1)
- o 1 to 2 cups (2)
- o 3 to 4 cups (3)
- o 5 to 6 cups (4)
- o more than 6 cups (5)

Q16 To which category did the (majority of) the disposed of **potato products** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ▢ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete potato fries package) (1)
- ▢ Partly used foods: Food that is disposed of after it is partly used (e.g., half a potato fries package) (2)
- ▢ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ▢ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 potato products (fries, hash browns, etc.)

Start of Block: Questionnaire 2 Pasta

Q17 In your household, how much **pasta** was disposed of in the past 7 days?

- o Less than 1 cup (1)
- o 1 to 2 cups (2)
- o 3 to 4 cups (3)
- o 5 to 6 cups (4)
- o More than 6 cups (5)

Q18 To which category did the (majority of) the disposed of **pasta** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ▢ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete pasta package) (1)

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- ▢ Partly used foods: Food that is disposed of after it is partly used (e.g., half pasta package) (2)
- ▢ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ▢ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Pasta

Start of Block: Questionnaire 2 Rice and other grains (including wraps, couscous, et cetera)

Q19 In your household, how much r**ice and remaining grains (including wraps, couscous, etc.)** was disposed of in the past 7 days?

- o Less than 1 cup (1)
- o 1 to 2 cups (2)
- o 3 to 4 cups (3)
- o 5 to 6 cups (4)
- o More than 6 cups (5)

Q20 To which category did the (majority of) the disposed of **r**ice and remaining grains belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ▢ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete rice package) (1)
- ▢ Partly used foods: Food that is disposed of after it is partly used (e.g., half rice package) (2)
- ▢ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ▢ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Rice and other grains (including wraps, couscous, et cetera)

Start of Block: Questionnaire 2 Beans, lentils, chickpeas, etc.

Q21 In your household, how much **beans, lentils, chickpeas, etc.** were disposed of in the past 7 days?

- o Less than 1 cup (1)
- o 1 to 2 cups (2)
- o 3 to 4 cups (3)
- o 5 to 6 cups (4)
- o More than 6 cups (5)

Q22 To which category did the (majority of) the disposed of **Beans, lentils, chickpeas, etc.** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

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- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., unopened bean jar) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half full bean jar) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Beans, lentils, chickpeas, etc.

Start of Block: Questionnaire 2 Meat & Poultry

Q23 In your household, how much meat and poultry was disposed of in the past 7 days? *A portion refers to one chicken breast, one steak, etc. In case of smaller pieces, as stew meat, try to estimate it in whole pieces of meat (e.g., one package of stew meat equals two portions.)*

- ○ Approximately half a portion or less (1)
- ○ Approximately 1 portion (2)
- ○ 2 to 3 portions (3)
- ○ 4 to 5 portions (4)
- ○ More than 5 portions (5)

Q24 To which category did the (majority of) the disposed of **meat and poultry** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., a package of sausage) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a package of sausage) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Meat & Poultry

Start of Block: Questionnaire 2 Meatless Alternatives

Q64 In your household, how much Meatless Alternative products were disposed of in the past 7 days? *A portion refers to one quarter pound patty, seven veggie nuggets, etc. In case of smaller pieces, as stew meat, try to estimate it in whole pieces of meat (e.g., one package of plant-based ground of 16 oz equals three portions.)*

- ○ Approximately half a portion or less (1)
- ○ Approximately 1 portion (2)
- ○ 2 to 3 portions (3)

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- 4 to 5 portions (4)
- More than 5 portions (5)

Q65 To which category did the (majority of) the disposed of **Meatless Alternative** products belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., a package of veggie nuggets) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a package of veggie nuggets) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Meatless Alternatives

Start of Block: Questionnaire 2 Fish

Q25 In your household, how much **fish** was disposed of in the past 7 days? *A portion refers to one fish fillet, one piece of salmon, etc.*

- Approximately half a portion or less (1)
- Approximately 1 portion (2)
- 2 to 3 portions (3)
- 4 to 5 portions (4)
- More than 5 portions (5)

Q26 To which category did the (majority of) the disposed of **fish** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete fish package) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a fish package) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Fish

Start of Block: Questionnaire 2 Sandwich Ingredients

Q27 In your household, how many **sandwich ingredients (deli meat slices, cheese slices, relishes etc.)** were disposed of in the past 7 days? *A portion is what is used for one sandwich. Consider vegetable ingredients (e.g., lettuce and tomato) under 'fresh vegetables'.*

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- Approximately half a portion or less (1)
- Approximately 1 portion (2)
- 2 to 3 portions (3)
- 4 to 5 portions (4)
- More than 5 portions (5)

Q28 To which category did the (majority of) the disposed of **sandwich ingredients (deli meat slices, cheese slices, relishes, etc.)** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete package with meat slices) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a package with meat slices) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Sandwich Ingredients

Start of Block: Questionnaire 2 Bread

Q29 In your household, how much **bread** was disposed of in the past 7 days? *A bun or sandwich is similar to one slice of bread.*

- Less than one slice of bread (1)
- One or a few slices of bread (2)
- Approximately half a loaf (3)
- Approximately one loaf (4)
- More than one loaf (5)

Q30 To which category did the (majority of) the disposed of **bread** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., whole loaf) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., slices of bread) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (e.g., bread crust) (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Bread

Start of Block: Questionnaire 2 Cereal (breakfast cereal, corn meal, oats, etc.)

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Q32 In your household, how much **cereal (breakfast cereal, corn meal, oats, etc.)** was disposed of in the past 7 days?

- Less than a cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)
- 5 to 6 cups (4)
- more than 6 cups (5)

Q33 To which category did the (majority of) the disposed of **cereals** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., a complete package of cereal) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a package of cereal) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Cereal (breakfast cereal, corn meal, oats, etc.)

Start of Block: Questionnaire 2 Yogurt, custard, etc.

Q34 In your household, how much **yogurt, custard, etc.** was disposed of in the past 7 days? (one cup has 8 ounces).

- Less than a cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)
- 5 to 6 cups (4)
- more than 6 cups (5)

Q35 To which category did the (majority of) the disposed of **yogurt, custard, etc.** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., a complete package of yogurt) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a package of yogurt) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

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End of Block: Questionnaire 2 Yogurt, custard, etc.

Start of Block: Questionnaire 2 Cheese (report cheese slices under 'Sandwich ingredients')

Q36 In your household, how much **cheese** was disposed of in the past 7 days? Report cheese slices under 'sandwich ingredients'. Note: there are 8 ounces in a cup.

- Less than one cup (1)
- 1 to 2 cups (2)
- 3 to 4 cups (3)
- 5 to 6 cups (4)
- More than 6 cups (5)

Q37 To which category did the (majority of) the disposed of **cheese** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete French cheese) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., partly used French cheese) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Cheese (report cheese slices under 'Sandwich ingredients')

Start of Block: Questionnaire 2 Eggs

Q38 In your household, how many **egg(s)** was/were disposed of in the past 7 days?

- Less than 1 egg (1)
- 1 egg (2)
- 2 to 3 eggs (3)
- 4 to 5 eggs (4)
- More than 5 eggs (5)

Q39 To which category did the (majority of) the disposed of **egg(s)** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete eggs) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., egg white) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

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End of Block: Questionnaire 2 Eggs

Start of Block: Questionnaire 2 Soups / stew

Q40 In your household, how much **soups / stew** was disposed of in the past 7 days? Note: one cup is 8 ounces.

- Less than a half a cup (1)
- 1/2 to 1 cup (2)
- 1 to 2 cups (3)
- 3 to 4 cups (4)
- More than 4 cups (5)

Q41 To which category did the (majority of) the disposed of **soups / stew** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete soup package) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a soup package) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (warmed soup or home-made soup) (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Soups / stew

Start of Block: Questionnaire 2 Condiments & Sauces (ketchup, mayonnaise, cocktail sauce, etc.)

Q42 In your household, how much **condiment and sauce (ketchup, mayonnaise, cocktail sauce, etc.)** was disposed of in the past 7 days? *One tablespoon equals half an ounce*

- Less than a tablespoon (1)
- 1 to 3 tablespoons (2)
- Multiple tablespoons (3)
- Approximately half a jar / bottle (4)
- More than one jar / bottle (5)

Q43 To which category did the (majority of) the disposed of **condiments and sauces** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., complete sauce jar) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a sauce jar) (2)

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- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Condiments & Sauces (ketchup, mayonnaise, cocktail sauce, etc.)

Start of Block: Questionnaire 2 Candy / cookies / granola bars / chocolate bars

Q44 In your household, how much **candy / cookies / granola bars / chocolate bars** were disposed of in the past 7 days? *A portion is one cookie, one small chocolate bar, etc.*

- o Approximately half a portion or less (1)
- o Approximately one portion (2)
- o 2 to 3 portions (3)
- o 4 to 5 portions (4)
- o More than 5 portions (5)

Q45 To which category did the (majority of) the disposed of **candy / cookies / granola bars / chocolate bars** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: Food that is disposed of which is not used at all (e.g., one cookie package) (1)
- ☐ Partly used foods: Food that is disposed of after it is partly used (e.g., half a cookie package) (2)
- ☐ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ☐ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Candy / cookies / granola bars / chocolate bars

Start of Block: Questionnaire 2 Salty snacks

Q46 In your household, how many **salty snacks** (potato chips / pretzels / nuts etc.) were disposed of in the past 7 days? *A portion is a handful of chips.*

- o Approximately half a portion or less (1)
- o Approximately 1 portion (2)
- o 2 to 3 portions (3)
- o 4 to 5 portions (4)
- o More than 5 portions (5)

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Q47 To which category did the (majority of) the disposed of **salty snacks** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ▢ Completely unused foods: Food that is disposed of which is not used at all (e.g., a full bag of crisps) (1)
- ▢ Partly used foods: Food that is disposed of after it is partly used (e.g., half a bag of crisps) (2)
- ▢ Meal leftovers: Meal leftovers that are disposed of after these were left on the plate, pots or pans (3)
- ▢ Leftovers after storing: Meal leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Salty snacks

Start of Block: Questionnaire 2 Non-alcoholic beverages (milk, juice, soda; excluded: water, tea

Q48 In your household, how many **non-alcoholic beverages (milk, juice, soda; excluded: water, tea, coffee)** were disposed of in the past 7 days? Note: A cup is 8 ounces.

- o Less than 1/2 a cup (1)
- o 1/2 to 1.5 cups (2)
- o Multiple cups (approximately half a quart) (3)
- o Approximately one quart (4)
- o More than one quart (5)

Q49 To which category did the (majority of) the disposed of **non-alcoholic beverages** belong? *Please mark the category that occurred the most. You can mark more than one box if multiple categories occurred in the same amount.*

- ▢ Completely unused foods: drinks that are disposed of which are not used at all (e.g., a milk package) (1)
- ▢ Partly used foods: drinks that is disposed of after it is party used (e.g., half a milk package) (2)
- ▢ Meal leftovers: beverage that is left in the glass (3)
- ▢ Leftovers after storing: beverage leftovers that are disposed of after these were stored (4)

End of Block: Questionnaire 2 Non-alcoholic beverages (milk, juice, soda; excluded: water, tea

Start of Block: Questionnaire 2 Alcoholic beverages

Q50 In your household, how many **alcoholic beverages** were disposed of in the past 7 days? Note: a cup is 8 ounces.

- o Less than 1/2 a cup (1)
- o 1/2 to 1.5 cups (2)

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- Multiple cups (approximately half a quart) (3)
- Approximately one quart (4)
- More than one quart (5)

Q51 To which category did the (majority of) the disposed of **alcoholic beverages** belong? *Please tick the category that occurred the most. You can tick more than one box if multiple categories occurred in the same amount.*

- ☐ Completely unused foods: drinks that are disposed of which are not used at all (e.g., a bottle of wine) (1)
- ☐ Partly used foods: drinks that is disposed of after it is party used (e.g., half a bottle of wine) (2)
- ☐ Meal leftovers: beverage that is left in the glass (3)
- ☐ Leftovers after storing: beverage leftovers that are disposed of after these were stored (4)

7.1.1.3. Closing Survey Part 1: Baseline

Start of Block: Welcome Block

Q31 On behalf of the City of Upper Arlington, Ohio State University and the Solid Waste Authority of Central Ohio (SWACO), thanks for agreeing to participate.

Please click through to start the survey.

End of Block: Welcome Block

Start of Block: Screener Block

Q1 Thinking about all the meals that are prepared in your home, do you prepare ...? Select one.

- Less than half (1)
- About half (2)
- More than half (3)

Q23 Which of the following categories best describes your age? Select one.

- Under 18 (1)
- 18-24 (2)
- 25-34 (3)
- 35-44 (4)
- 45-54 (5)
- 55-64 (6)
- 65 and older (7)

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End of Block: Screener Block

Start of Block: Consent Block

Q4 Researchers from The Ohio State University would like to ask you some questions about food in your home and questions about you and your household. These questions are being asked by Professor Brian Roe of Ohio State University and will take about 5 minutes to answer. You will also be eligible to complete a follow up survey should you choose to complete the first survey. The follow up survey would be available about one week after the completion of this survey and would take about 15-20 minutes to complete.

The survey requires you to complete both multiple choice and open ended (write in) questions. Open ended questions should require brief responses, but the length of the response is up to you. This study does not require the study coordinator to access any of your personal information. Your de-identified information may be used or shared with other researchers without your additional informed consent. Information provided to this study does not have the potential to damage your financial standing, employability or reputation, or place you at risk of criminal or civil liability. We will work to make sure that no one sees your survey responses without approval. But, because we are using the Internet, there is a chance that someone could access your online responses without permission. In some cases, this information could be used to identify you.

Your participation is voluntary and you may skip any question or request for any reason. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may choose to stop participating at any time without penalty or loss of benefits to which you are otherwise entitled. There are no direct benefits to you from participating. You can choose to receive information about how your responses compare to average responses of other participants.

If you have questions about the survey you may contact Brian Roe at 614-688-5777. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Do you consent to participate?

- o Yes (1)
- o No (2)

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End of Block: Consent Block

Start of Block: Demographics Block

Q5 **Demographics Module**

Q6 Are you…? Select one.

- Male (1)
- Female (2)
- Prefer not to answer (3)

Q7 Are you Hispanic or Latino? Select one.

- Yes (1)
- No (2)
- Prefer not to answer (3)

Q8 What is your race? Select all that apply.

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ Asian (3)
- ☐ Native Hawaiian or other Pacific Islander (4)
- ☐ American Indian or Alaskan Native (5)
- ☐ Some other race (6)
- ☐ ⊗Prefer not to answer (7)

Q9 What is the highest grade or level of school you have completed? Select one.

- Less than 12th grade, NO DIPLOMA (1)
- High school graduate, DIPLOMA or GED (2)
- Some college or Associate degree (3)
- Bachelor's degree (4)
- Graduate or professional degree (5)

Q21 How many people live in your household as of today? Select one.

	Today
Children 0-5 years of age (1)	▼ 0 (1 ... 10 (11)
Children 6-17 years of age (2)	▼ 0 (1 ... 10 (11)
Male adults 18 years or older (3)	▼ 0 (1 ... 10 (11)
Female adults 18 years or older (4)	▼ 0 (1 ... 10 (11)

Q22 How would you best describe your employment situation? Select one.

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- Full time employment (35 hours a week or more) (1)
- Part time employment (less than 35 hours a week) (2)
- Unemployed (3)
- Student (4)
- Retired (5)
- Unable to Work (6)

Q10 Which of the following categories best describes your annual household income before taxes during 2019? Select one.

- Less than $10,000 (1)
- $10,000 - $19,999 (2)
- $20,000 - $29,999 (3)
- $30,000 - $39,999 (4)
- $40,000 - $49,999 (5)
- $50,000 - $59,999 (6)
- $60,000 - $69,999 (7)
- $70,000 - $79,999 (8)
- $80,000 - $89,999 (9)
- $90,000 - $99,999 (10)
- $100,000 - $124,999 (11)
- $125,000 - $149,999 (12)
- $150,000 and above (13)
- Prefer not to answer (14)

Q23
About how often do you go grocery shopping? Do not consider occasions where a few items are obtained because they were forgotten the previous time you got groceries. *Select one*.

- Twice a week or more (1)
- Once a week (2)
- 2-3 times a month (3)
- once a month or less often (4)

Q24 What day of the week is your trash collected in Upper Arlington?

- Monday (1)
- Tuesday (2)
- Wednesday (3)
- Thursday (4)
- Friday (5)

End of Block: Demographics Block

Start of Block: Previous Round Block

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Q24 Did you participate in the previous SWACO survey conducted in March 2021?

- Yes (1)
- No (2)
- Not sure (4)

Q25 Did you authorize an audit of your waste bin as part of the March survey?

- Yes (1)
- No (2)
- Not sure (4)

Q26 Thanks for allowing your waste bin to be audited during the March study. To better understand these results, we wanted to know if the amount of material in your bin was higher, lower or about the same as average during the week of that audit. For example, the week of the study (March 14-March 18) was also Upper Arlington school's spring break week, which may lead to less waste than normal for your household.

- higher than normal (1)
- about the same as normal (2)
- lower than normal (4)

End of Block: Previous Round Block

Start of Block: Free Gift Block

Q27 Were you aware of the free gift program offered by SWACO in April 2021?

- Yes (1)
- No (2)
- Not sure (4)

Q28 Did you receive a free gift through the SWACO program?

- Yes (1)
- No (2)
- Not sure (4)

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Q29 Which of the following items did you receive?

- ☐ BluApple Produce Preservation Pod (1)
- ☐ BPI Certified Compostable Liners (2)
- ☐ Earth Machine (Contained Backyard Compost Bin) (3)
- ☐ ⊗None of these (4)

Q30 Did you use the BluApple Pods to preserve your produce?

- ○ Yes (1)
- ○ No (2)

Q31 How frequently did you use the Earth Machine (Contained Backyard Compost Bin)?

- ○ Never (1)
- ○ Several times a week (2)
- ○ Daily (4)

Q32 What prevented you from using the free compost bin?

Q33 How frequently did you use the BPI Certified Compostable Liners?

- ○ Never (1)
- ○ A few times (2)
- ○ Always use them (3)

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Q34 What prevented you from using the free liners?

End of Block: Free Gift Block

Start of Block: Next Survey Preparation Instructions

Q17 Please read the next part carefully.

In about one week we will send you a follow up survey. For the next 7 days please pay close attention to the food and drinks you use in your home In particular, please pay attention to the amounts of different foods that you throw away because they are past date, spoiled or are no longer wanted for other reasons Do not worry about tracking items that you normally would not eat, such as bones, peels, shells, etc.

Question: What will you pay attention to for the next 7 days?

- The amounts of different foods that are thrown away at home because they are past date, spoiled or are no longer wanted for other reasons (1)
- Bones, peels, shells, etc (2)

End of Block: Next Survey Preparation Instructions

Start of Block: End of survey

Q25 Please enter an e-mail address where we should send the link to the follow up survey

- E-mail address (1) _____

Q22 Please re-enter the e-mail address below

- E-mail address (1) _____

Q26 Would you like to receive a report that compares your responses to those of the average Upper Arlington and average national household?

- Yes (1)
- No (2)

Q29 We are interested in understanding how closely the survey responses you will provide during next week's follow up survey match the amounts of food that end up in the garbage that is collected from individual homes. Comparing your responses to next week's survey to the amount of food that ends up in the garbage would help assess the accuracy of the follow up survey.

If you provide us with your street address, we may: Compare the amount of food waste in your garbage to your responses to next week's survey Note: just like all your responses to this survey, personal information will not be shared

If you agree, please enter your address below.

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- Address Line 1 (1) _____
- Address Line 2 (2) _____
- City (3) _____
- State (4) _____
- Zip Code (5) _____

End of Block: End of survey

7.1.1.4 Closing Survey Part 2: Follow-Up

Start of Block: Introduction

Q1 Last week you were asked to pay close attention to the food and drinks in your home that were discarded, composted or fed to animals.

This questionnaire **will** be about: All edible food and drink products that were spoiled, past their expiration date or otherwise unwanted that you discarded or composted in the past 7 days.

Please include it whether you threw the food away in a trash can, garbage disposal, compost heap or gave it to an animal (pet, birds, etc.), or otherwise. Please include it all.

It will **not** be about: Bones, peels, seeds, stumps or similar things that you never typically eat.

Food and drink products that are thrown away when eating in a restaurant or cafeteria.

End of Block: Introduction

Start of Block: Questionnaire 1

Q2 Please mark the products that were discarded in your household in the past 7 days. In cases where items have several major ingredients, please report each ingredient separately. ***Select all that apply***

- ☐ Fresh vegetables and salads (1)
- ☐ Other vegetables (jar / canned / frozen) (2)
- ☐ Fresh fruit (3)
- ☐ Other fruit (jar / canned / dried / frozen) (4)
- ☐ Potatoes (5)
- ☐ Potato products (fries, hash browns, etc. - report potato chips under 'salty snacks') (6)
- ☐ Pasta (7)
- ☐ Rice and other grains (including wraps, couscous, etc.) (8)
- ☐ Beans, lentils, chickpeas, etc. (9)
- ☐ Meat (please report deli meat under 'sandwich ingredients') (10)
- ☐ Meatless Alternatives (11)
- ☐ Fish (12)
- ☐ Sandwich ingredients (deli meats, cheese slices, relishes, etc., but report lettuce and vegetables under 'fresh vegetables and salads') (13)

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- ☐ Bread (14)
- ☐ Cereals (breakfast cereal, corn meal, oats, etc.) (15)
- ☐ Yogurt, custard, etc. (16)
- ☐ Cheese (report cheese slices under 'Sandwich ingredients') (17)
- ☐ Eggs (18)
- ☐ Soups / stews (19)
- ☐ Condiments and sauces (ketchup, mayonnaise, cocktail sauce, etc.) (20)
- ☐ Candy / cookies / granola bars / chocolate bars (21)
- ☐ Salty snacks (chips / nuts / pretzels, etc) (22)
- ☐ Non-alcoholic beverages (milk, juice, soda. Exclude: water, tea, coffee) (23)
- ☐ Alcoholic beverages (24)
- ☐ ⊗I have not thrown away any food or drink products (25)

End of Block: Questionnaire 1

Start of Block: Events

Q60 In the past 7 days, which of the following issues in your household may have affected the amount of food that you threw away or composted? (Mark all that apply).

- ☐ Had unexpected guests for a meal (1)
- ☐ Guests expected for a meal unexpectedly did not attend (2)
- ☐ Ate out unexpectedly rather than eating meal(s) at home (3)
- ☐ Received food that was not as fresh or as high quality as normal (4)
- ☐ Hosted an event involving food (5)
- ☐ Tried a new recipe or had a recipe not work as expected (6)
- ☐ Fewer meals at home than typical (8)
- ☐ Expired/excessive items from bulk or batch shopping in warehouse clubs (Costco, Sam's Club, etc.) (10)
- ☐ Another issue not mentioned above occurred that affected the amount of food that was thrown away (7)
- ☐ ⊗None of the above (9)

Q61 You marked that other issues not mentioned in previous question affected the amount of food that was thrown away in the past 7 days. Please briefly describe the issue(s).

Questions 59-106 provide the following response options:

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	A lot less food than normal	A little less than normal	About the same amount of food as normal	A little more than normal	A lot more food than normal
	-2	-1	0	1	2
()					

Q59 Compared to the last two months, would you say the past 7 days you threw away...

Q61 During the past 7 days, what percent of your daily non-sleeping time (including any paid work, school and socializing) was spent in your home?

Q62 During the past 7 days, what percent of your meals have been home-prepared meals?

Q106 How often do you compost inedible food scraps and food that you do not eat?

End of Block: Events

Start of Block: Food Waste Knowledge and Effort

Q65 How would you rate your knowledge of what foods can and cannot be composted?

	No knowledge at all	Somewhat knowledgeable	Very knowledgeable
	-2 -1	0	1 2
()			

Q66 How would you rate your knowledge of how to best store your foods to maximize their freshness?

	No knowledge at all	Somewhat knowledgeable	Very knowledgeable

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	-2	-1	0	1	2
()					

Q67 How would you rate your knowledge of food waste prevention tactics including meal planning and prepping, sticking to your meal plan, etc.

	No knowledge at all		Somewhat knowledgeable		Very knowledgeable
	-2	-1	0	1	2
()					

End of Block: Food Waste Knowledge and Effort

Start of Block: Attitudes

Q91 In the past 30 days, do you recall seeing or hearing about the "Save More Than Food" campaign?

- ○ Yes (1)
- ○ No (2)

Q92 Which of the following ways do you recall seeing or hearing about the "Save More Than Food" campaign?

- ☐ Facebook (1)
- ☐ Twitter (2)
- ☐ LinkedIn (3)
- ☐ Instagram (4)
- ☐ Community newsletter (5)
- ☐ Internet search (6)
- ☐ Television (7)
- ☐ Online advertisement (8)

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- ☐ Printed flyer (9)
- ☐ Mailed materials (physical mailbox) (10)
- ☐ Emailed materials (11)
- ☐ Word of mouth (12)
- ☐ Not sure (14)
- ☐ ⊗None of these (13)

Q99 The next section aims to learn how your attitudes about food waste and food waste behaviors may have been impacted by food waste messaging and the "Save More Than Food" campaign in your community.

Q68 If you further reduced food waste, would it cost you money or save you money?

	Cost a lot	Cost a little	No change	Save a little	Save a lot
	-2	-1	0	1	2
()					

Q69 To what extent would you agree with the following statements about food that is thrown away in your home?

(Respondents are provided with the following options)

Disagree strongly (1)	Disagree somewhat (2)	Agree somewhat (3)	Agree strongly (4)

Throwing away food is bad for the environment (1)

You throw away food if the package date has passed (2)

You feel guilty when you throw away food (3)

You don't have enough time to worry about the amount of food you waste (4)

Some food waste is necessary to make sure meals taste fresh and good (5)

It would be difficult to reduce your household's food waste any further (6)

You waste more food when you buy things in large packages or when you buy in large quantities during a sale (7)

Your household wastes more food than other households of similar size (8)

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You should make an effort to reduce food waste when possible (9)

Your actions to reduce food waste make a positive difference for your family (10)

Your actions to reduce food waste make a positive difference for your community (11)

End of Block: Attitudes

Start of Block: Diversion Actions

Q75 Which of the following food waste **prevention** actions have you taken in the past 30 days? (check all that apply)

- ☐ Shopped with a list to avoid impulse buys (1)
- ☐ Created a meal plan (2)
- ☐ Properly stored food to maximize freshness (3)
- ☐ Watched a SWACO webinar about food waste prevention (4)
- ☐ Purchased bruised or discounted food items (5)
- ☐ Other (please specify) (6)
- ☐ ⊗None (9)

Q76 What other food waste prevention actions have you taken in the past 30 days?

Q77 How often did you shop with a list?

- ○ Tried it once (1)
- ○ Occasionally (2)
- ○ Regularly (3)
- ○ Every time (4)

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Q78 How often did you create meal plans?

- Tried it once (1)
- Occasionally (2)
- Regularly (3)
- Every time (4)

Q79 How often did you properly store food items to maximize freshness?

- Tried it once (1)
- Occasionally (2)
- Regularly (3)
- Every time (4)

Q80 How often did you eat bruised or discounted food items?

- Tried it once (1)
- Occasionally (2)
- Regularly (3)
- Every time (4)

Q87 What would make you prevent food waste more? (select all that apply)

- ☐ Know how to divert food waste (1)
- ☐ Incentives for reducing food waste (2)
- ☐ Knowing how food waste prevention saves me money (3)
- ☐ Knowing how food waste prevention helps the community (6)
- ☐ Knowing how food waste prevention helps feed those in need (4)
- ☐ Knowing how food waste prevention helps the environment (5)
- ☐ Other (Please specify) (8)
- ☐ ⊗None of the above (7)

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Q98 What other method(s) would make you prevent food waste more?

Q81 Which of the following food waste **recovery** actions have you taken in the past 7 days? (select all that apply)

- ☐ Ate leftovers (1)
- ☐ Remade leftovers into a new recipe (2)
- ☐ Froze food to prevent it from going bad (3)
- ☐ Donated excess unopened food items (4)
- ☐ Shared excess prepared food with others outside my household (5)
- ☐ Fed food scraps to pets (6)
- ☐ Other (please specify) (7)
- ☐ ⊗None (8)

Q84 What other food waste recovery actions have you taken in the past 30 days?

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Q82 Have you taken any of the following actions to avoid throwing away or landfilling food in the past 30 days? (select all that apply)

- ☐ Composted food scraps in your back yard (1)
- ☐ Composted food scraps at a community drop-off location (2)
- ☐ Composted food scraps through a subscription service (3)
- ☐ Applied for a backyard composting equipment rebate through the Franklin Soil and Water Conservation District (4)
- ☐ Other (please specify) (5)
- ☐ ⊗None (6)

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Q83 What other actions have you taken to avoid throwing away or landfilling food in the past 30 days?

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Q86 Did you try composting for the first time over the last 3 months?

- Yes (1)
- No (2)

Q100 Did you use any of the following resources to help you get started? (select all that apply)

- ☐ Upper Arlington webinars on composting (1)
- ☐ Save More Than Food Compost Postcard in the mail (2)
- ☐ Franklin Soil and Waster Conservation equipment rebate (3)
- ☐ Upper Arlington food waste drop-off sites (4)

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Q101 Where did you hear about the food waste drop-off program? (select all that apply)

- ☐ City of Upper Arlington Resources (1)
- ☐ Save More Than Food Resources (2)
- ☐ Word of mouth (3)
- ☐ Other (4)

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Q102 Where else did you hear about the food waste drop-off program?

Q88 What would make you compost your food waste more? (select all that apply)

- ☐ More community compost drop-off sites (1)
- ☐ More compost bins in public areas (2)
- ☐ Curbside compost service (3)
- ☐ Knowing how composting helps the community (4)
- ☐ Free compost collection containers for my kitchen (5)
- ☐ ⊗I already compost all my waste (6)

Q85 What barriers keep you from participating in other food waste diversion activities? (select all that apply)

- ☐ I don't know how to participate (1)
- ☐ I need additional tools/equipment to participate (2)
- ☐ It costs money to participate (3)
- ☐ It takes too much time to participate (4)
- ☐ I am not interested in food waste diversion (5)
- ☐ Other (please specify) (6)
- ☐ ⊗None (7)

Q107 What are the other barriers that keep you from participating in other food waste diversion activities?

End of Block: Diversion Actions

Start of Block: Messaging

Q70 Reducing food waste conserves resources in Central Ohio. Please use the scale below to indicate how important it is to you to conserve the following resources.

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Q71 Global Environmental Resource conservation: Reducing greenhouse gases, Increasing global biodiversity and ecosystem health

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
	-2	-1	0	1	2
()					

Q72 Local Environmental Resource Conservation: Farmland use, Air pollution, Soil erosion, Water pollution

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
	-2	-1	0	1	2
()					

Q73 Economic Loss: Personal financial savings, Local job creation, Economic improvement

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
	-2	-1	0	1	2

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()	

Q74 Opportunity to Support the Community: Provide meals for local food insecure residents

Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
-2	-1	0	1	2

()	

Q102 For the next few questions, use the sliding scale to indicate whether each statement would encourage you to take action to reduce the amount of food that you discard.

Q97 Each year, Franklin County residents waste 160,000 acres of land used to produce food that is never eaten. That's roughly half the landmass of Franklin County.

Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely
-2	-1	0	1	2

()	

Q98 Each resident in Franklin County wastes more than 30 gallons of water a year on food that is produced but never eaten.

Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely

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	-2	-1	0	1	2
()					

Q99 Every year, the average family of four wastes $1,500 on food that is purchased but never eaten.

	Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely
	-2	-1	0	1	2
()					

Q100 When food is wasted in Central Ohio, all the energy and fuel used to grow, harvest and transport it is lost.

	Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely
	-2	-1	0	1	2
()					

Q101 For every meal missed by struggling neighbors in our community, three potential meals are sent to the landfill.

	Very Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Very Likely

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	-2	-1	0	1	2
()					

End of Block: Messaging

Start of Block: Campaign Exposure

Q90 In the past 12 months, outside of this survey, have you read, seen or heard anything about the amount of food that is wasted or about ways to reduce the amount of food that is wasted?

- Yes (1)
- No (2)
- Not sure (3)

Q93 Where would you currently look to answer questions about how to reduce food waste?

- ☐ Google search (1)
- ☐ Government/municipal/community website (2)
- ☐ Grocery store/food business website (3)
- ☐ Save More Than Food Mail resources (4)
- ☐ Save More Than Food website (5)
- ☐ Other (please specify) (7)
- ☐ ⊗None of the above (6)

Q94 What other channels do you utilize to answer questions about how to reduce food waste?

Q103 In your opinion, is the campaign effective at creating awareness about the importance of food waste?

- Very effective (1)
- Effective (2)
- Neutral (3)
- Ineffective (4)
- Very ineffective (5)

Q104 In your opinion, is the Save More Than Food effective at creating action around food waste reduction?

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- Very effective (1)
- Effective (2)
- Neutral (3)
- Ineffective (4)
- Very ineffective (5)

End of Block: Campaign Exposure

Start of Block: End of survey

Q103 Please enter the e-mail address from which you gained access to this follow-up survey

- E-mail Address (1) _____

Q104 Please re-enter the e-mail address below

- E-mail Address (1) _____

End of Block: End of survey

The remainder of the survey follows the same format as questions 3-51 in the Opening Survey Part 2: Follow Up

7.2 Outreach Materials

7.2.1 Mailed Materials

7.2.1.1 Survey Promotion Introductory Letter

Page 1:

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City of Upper Arlington

SWACO FROM WASTE TO RESOURCES

The Ohio State University

February 8, 2021

Dear Neighbor,

Did you know that nearly 1 million pounds of food is sent to landfill every single day by residents and businesses in central Ohio? When food goes to waste, so does all of the time, money, and resources that went into producing and distributing it, not to mention the opportunities we miss to help those in need in our community.

By working together, we can make changes that improve our community and stop valuable resources from going to waste.

Researchers at The Ohio State University are working with the Solid Waste Authority of Central Ohio (SWACO) and the City of Upper Arlington to test the effectiveness of various food waste diversion education materials and activities. These outreach materials share tools, tips, tricks, and opportunities to connect with local resources to reduce your food waste at home so that you can save money, resources, and meals for hungry neighbors. This study will focus on documenting behaviors related to food waste and learn how central Ohioans can best conserve resources, meals, and money by reducing food waste. Insights from this study in Upper Arlington will inform future food waste reduction outreach efforts across the central Ohio region and beyond.

Can you help?

Would you be willing to tell us a little about the food that gets discarded in your home during a typical week by monitoring it and responding to two short surveys?

The study involves an initial 5-minute survey which will include instructions on how to monitor the types and quantities of food being discarded in your home over the following week. At the end of the week, you'll receive a follow up 15-minute survey to report the food discarded. Respondents must be 18 years or older and should be responsible for at least half of the food preparation duties taking place in your home. All data and information about your household will be kept private and not available publicly.

To get started, using the camera feature on your smart phone, scan the QR code on the back side of this letter or type 'go.osu.edu/UAFood' into your internet browser on your phone or computer. Or, learn more about the project and access the survey through the City of Upper Arlington at https://upperarlingtonoh.gov/food-waste-audit/.

Page 2:

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It's that easy!

And, you're free to stop participating at any point you'd like without jeopardizing your access to services or events provided by The Ohio State University, SWACO or the City of Upper Arlington.

Thank you for participating. We'll make sure to share the results with you at the end of the study.

Thank you,

Steven R. Schoeny
City Manager, The City of Upper Arlington

Ty Marsh
Executive Director, SWACO

Brian Roe
Professor, Ohio State University

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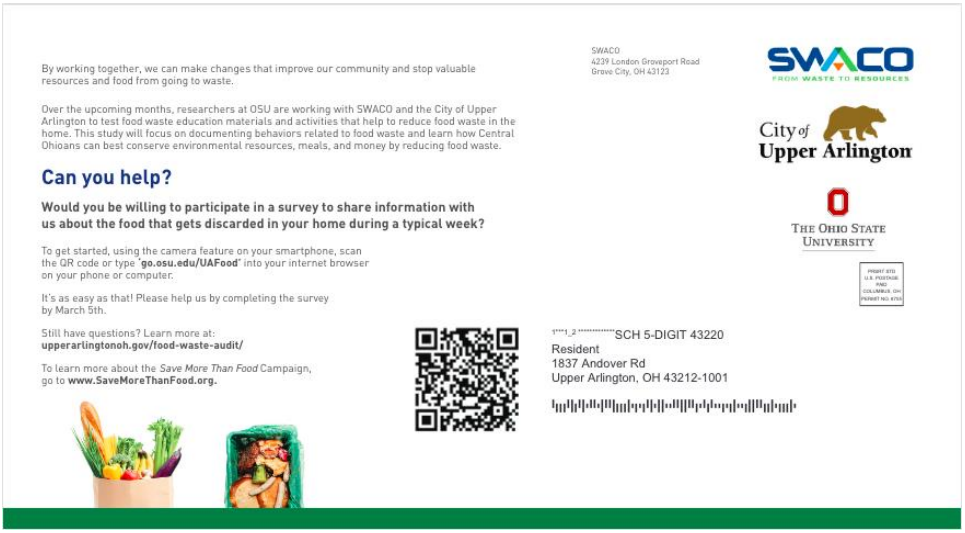
7.2.1.2 Survey Promotion Post Card

Side 1:

Side 2:



7.2.1.3 Food Storage Post Card

Side 1:

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Electronic copy available at: https://ssrn.com/abstract=4157980

Side 2:

7.2.1.4 Reducing Food Waste at Home Magnet Mailer

Side 1: Post Card Front with Magnet Attachment

Side 1: Post Card Front without Magnet Attachment

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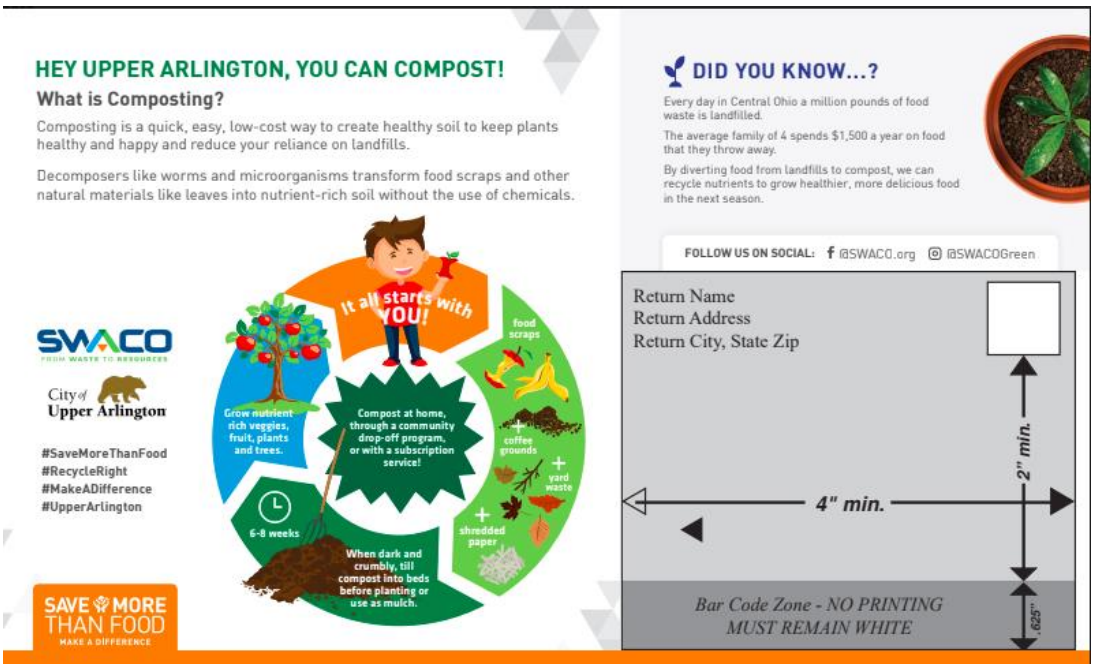
Side 2: Post Card Back

Electronic copy available at: https://ssrn.com/abstract=4157980

7.2.1.5 Compost at Home Post Card
Side 1:

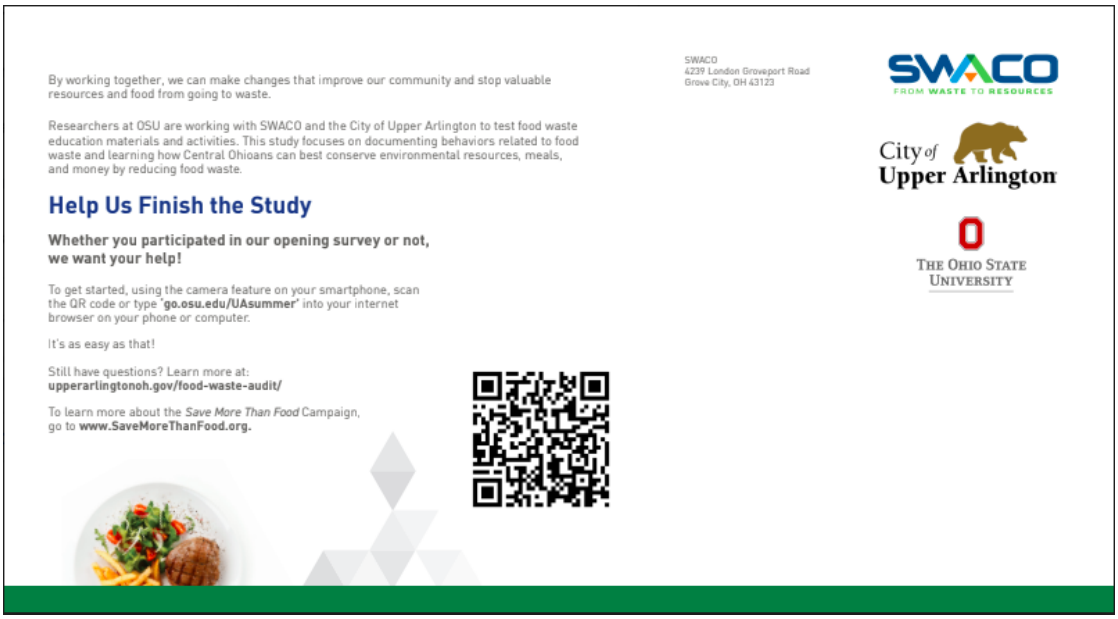
Side 2:



7.2.1.6 Closing Survey Promotion Post Card
Side 1:

Electronic copy available at: https://ssrn.com/abstract=4157980

Side 2:



7.2.2 Give-Away Materials

7.2.2.1 Outreach Email Promoting Give-Away Items

The content below was used to reach out to survey participants in Test Area 2. These residents were offered three gift options. Residents who participated in the survey in Test Area 1 were offered only the BluApple prevention tool. That email content included an adapted version of the language used below.

Dear Upper Arlington Resident,

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Thank you for your participation in our food waste study! Your participation helps us understand what food is being wasted in central Ohio homes and what educational tools and outreach methods best assist you in reducing your waste.

As a thank you for your participation and to further assist you in reducing food waste, we would like to offer you the following tools at no cost to you! Please take a look at the options below and fill out our survey to let us know which you would like. Our team will reach out to you to facilitate pick-up/delivery of your free items.

BPI Certified Compostable Liners (Pack of 25 Bags)

The City of Upper Arlington hosts three food waste collection sites (learn more here) where you can drop off food scraps for composting. These compostable bags are acceptable in the program and make it more convenient to collect your food scraps at home and transport them to the drop off site.

BluApple Produce Preservation Pod

As fruits and vegetables age, they give off ethylene gas, which speeds up the spoilage process. BluApple's ethylene absorption technology is a safe and proven approach to collecting these gases and helping your produce to last longer. Just place the BluApple in the refrigerator or storage bin along with your produce to start saving food.

Earth Machine, Contained Backyard Compost Bin

Looking to take a more hands-on approach? You can compost your own food scraps in your back yard with this low maintenance rodent proof compost bin, The Earth Machine. By composting at home, you not only reduce your food waste, but also produce your own finished compost to apply to your garden or yard to improve soil health.

For residents interested in receiving a compost bin, we ask that you join us for a refresher on the basics of backyard composting and to learn how to get the most out of your rodent-proof bin. The live session will take place on May 11 from 11:30am-12:30pm (register here). If you are unable to attend that time, you will be asked to view the webinar recording on your own time before you can pick up your bin.

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Fill out the survey at the link below to let us know which items you are interested in. You will be notified via email with details regarding their item pick-up/delivery.

Sign up for your FREE thank you gift: https://forms.gle/MeV8WcB65pjhUau47

We appreciate your support of our food waste study and hope you will fill out our closing survey when links are shared with you in the coming months. Please check out other tips and resources to help you reduce food waste in our home by visiting www.SaveMoreThanFood.org.

Sincerely,

The project teams at the City of Upper Arlington, The Ohio State University, and SWACO

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