



June 2019

# FOOD LOSS AND WASTE

## Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal

Accessible Version

# GAO Highlights

Highlights of [GAO-19-391](#), a report to congressional requesters

## Why GAO Did This Study

The Natural Resources Defense Council reported that in the United States up to 40 percent of the food supply goes uneaten. FLW has significant economic, environmental, and social effects on various stakeholders, including businesses and consumers. In 2015, EPA and USDA announced a national goal to reduce FLW in the United States by half by 2030. In 2018, FDA joined EPA and USDA in these efforts.

GAO was asked to examine efforts by federal agencies to reduce FLW. This report (1) describes nonfederal stakeholder views on key challenges to reducing FLW in the United States, (2) describes actions EPA and USDA have taken to address key challenges to reducing FLW in the United States, and (3) examines federal planning efforts toward achieving the national FLW reduction goal. GAO reviewed federal reports on FLW; analyzed agency documents; interviewed officials from EPA, FDA, USDA, and states and representatives of nonfederal stakeholders, such as academic institutions, industry, international organizations, nonprofit organizations, and a tribal organization, based on their demonstrated expertise on FLW; and attended conferences on FLW.

## What GAO Recommends

GAO is making three recommendations in this report. GAO is recommending that EPA, FDA, and USDA incorporate leading collaboration practices as they implement their interagency strategic plan to reduce FLW.

View [GAO-19-391](#). For more information, contact Steve Morris at (202) 512-3841 or [morriss@gao.gov](mailto:morriss@gao.gov).

June 2019

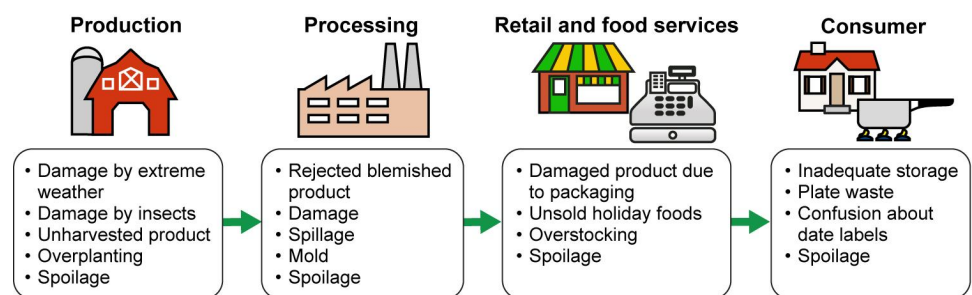
## FOOD LOSS AND WASTE

### Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal

## What GAO Found

GAO identified three key areas in which challenges exist to reducing food loss and waste (FLW) in the United States: (1) limited data and information about FLW; (2) a lack of awareness and education about FLW; and (3) limited infrastructure and capacity. For example, the causes of FLW vary across the stages of the food supply chain (see figure), but the share of total FLW due to each of these causes is currently unknown, according to a U.S. Department of Agriculture (USDA) report. GAO identified these challenges through interviews with selected stakeholders.

Food Supply-Chain Stages and Examples of Causes of Food Loss and Waste



Source: GAO analysis of U.S. Department of Agriculture Economic Research Service data. | GAO-19-391

The Environmental Protection Agency (EPA) and USDA have taken initial actions to address key challenges to reducing FLW in the United States since announcing a national FLW reduction goal in 2015. These actions include conducting a study to identify gaps in information about farm-level FLW and building public awareness about ways to reduce FLW.

EPA, USDA, and the U.S. Department of Health and Human Services' Food and Drug Administration (FDA) have taken some actions to plan and organize their efforts toward achieving the national FLW reduction goal. For example, EPA developed an internal plan that established action areas, goals, and activities for reducing FLW, and USDA designated an individual to guide USDA's FLW efforts. In October 2018, EPA, USDA, and FDA signed an interagency agreement committing them to developing a strategic plan to improve their collaboration and coordination in reducing FLW. In April 2019, the agencies announced an interagency strategic plan with prioritized action areas to reduce FLW, but this strategic plan does not address how it will incorporate key practices for interagency collaboration that GAO identified, including (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short- and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. By incorporating such practices as they implement their interagency strategic plan, EPA, USDA, and FDA would have better assurance that they were effectively collaborating toward achieving the national FLW reduction goal.

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# Contents

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Letter	1
Background	7
Nonfederal Stakeholders Cited Various Challenges to Reducing Food Loss and Waste in the United States	13
EPA and USDA Have Taken Initial Actions to Address Key Challenge Areas to Reducing Food Loss and Waste	18
EPA, USDA, and FDA Have Done Some Initial Planning toward Achieving the National FLW Reduction Goal	30
Conclusions	35
Recommendations for Executive Action	35
Agency Comments	36
<hr/>	
Appendix I: Comments from the U.S. Environmental Protection Agency	39
Appendix II: Comments from the U.S. Department of Agriculture	42
Appendix III: Comments from the U.S. Department of Health and Human Services	44
Appendix IV: GAO Contact and Staff Acknowledgments	47
Appendix V: Accessible Data	48
Data Table	48
Agency Comment Letters	48
<hr/>	
Figures	
Figure 1: Food Supply-Chain Stages and Examples of Causes of Food Loss and Waste	11
Figure 2: Environmental Protection Agency's Food Recovery Hierarchy	12
Figure 3: EPA Total Municipal Solid Waste Landfilled by Material, 2015	19
Figure 4: U.S. Department of Agriculture "Let's Talk Trash" Infographic	24
Accessible Data for Figure 3: EPA Total Municipal Solid Waste Landfilled by Material, 2015	48

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### **Abbreviations**

CEQ	Council on Environmental Quality
EPA	Environmental Protection Agency
ERS	Economic Research Service
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FLW	food loss and waste
OMB	Office of Management and Budget
ReFED	Rethink Food Waste Through Economics and Data
USDA	U.S. Department of Agriculture

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June 21, 2019

The Honorable Rosa DeLauro  
Chairwoman  
Subcommittee on Labor, Health and  
Human Services, Education, and  
Related Agencies  
Committee on Appropriations  
House of Representatives

The Honorable Chellie Pingree  
House of Representatives

In 2017, the Natural Resources Defense Council reported<sup>1</sup> that, in the United States, up to 40 percent of the food supply goes uneaten.<sup>2</sup> In addition, in 2016, Rethink Food Waste Through Economics and Data (ReFED) reported that more than \$218 billion—1.3 percent of the U.S. gross domestic product—is spent each year on growing, processing, transporting, and disposing of food that is not eaten.<sup>3</sup> For the purposes of this report, we refer to food loss and waste (FLW) as any food originally meant for human consumption that leaves the human food supply chain, even if it is directed to other uses, such as animal feed or bioenergy.<sup>4</sup> FLW may occur across the entire food supply chain and has significant economic, environmental, or social effects on various stakeholders,

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<sup>1</sup>Natural Resources Defense Council, *Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill* (August 2017). The Natural Resources Defense Council is an international nonprofit environmental organization that works to protect natural resources, public health, and the environment.

<sup>2</sup>K. D. Hall et al., “The Progressive Increase of Food Waste in America and Its Environmental Impact,” *PLoS ONE*, vol. 4, no. 11 (2009): p. e7940.

<sup>3</sup>Rethink Food Waste Through Economics and Data, *A Roadmap to Reduce U.S. Food Waste by 20 Percent* (2016). According to this report, each year 52.4 million tons of food is sent to landfills and an additional 10.1 million tons remain unharvested at farms, totaling 62.5 million tons of annual food waste. This total represents an average of over 171,000 tons of food waste generated each day. ReFED is a nonprofit organization that focuses on accelerating solutions for food loss and waste (FLW) in the United States, including prevention, as a strategy for creating economic value, resource conservation, creating jobs, alleviating hunger, and reducing greenhouse gas emissions.

<sup>4</sup>For the purposes of this report, we refer to the food supply chain as having four stages: (farm) production; processing; retail and food services; and consumer, as shown in fig. 1 below.

including businesses and consumers. For example, in 2014, the U.S. Department of Agriculture (USDA) reported that FLW costs consumers \$371 per person each year.<sup>5</sup>

According to a 2017 study, the environmental effects of FLW include biodiversity loss and the use of resources, such as cropland, fertilizers, and water, to grow food that is never eaten.<sup>6</sup> In addition, in 2018 the Environmental Protection Agency (EPA) reported that, based on 2015 data, food constituted 22 percent of all waste in landfills.<sup>7</sup> Due to the lack of oxygen, as food decays in landfills it produces methane, a greenhouse gas that contributes to climate change.<sup>8</sup> Furthermore, according to a 2018 USDA report, 40 million Americans lived in households that were food insecure at some point during the previous year.<sup>9</sup> Recovering edible food is an opportunity to help feed people. For example, in 2016, ReFED estimated that by increasing food recovery through food donations, food

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<sup>5</sup>U.S. Department of Agriculture, Economic Research Service, *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*, Economic Information Bulletin Number 121 (Washington, D.C.: February 2014).

<sup>6</sup>Commission for Environmental Cooperation, *Characterization and Management of Food Loss and Waste in North America* (Montreal, Canada: 2017).

<sup>7</sup>Environmental Protection Agency, *Advancing Sustainable Materials Management: 2015 Fact Sheet; Assessing Trends in Material Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling in the United States* (July 2018).

<sup>8</sup>U.S. Environmental Protection Agency, *Basic Information about Landfill Gas*, accessed December 4, 2018, <https://www.epa.gov/lmop/basic-information-about-landfill-gas>. When food is first deposited in a landfill, it undergoes an aerobic (with oxygen) decomposition stage when little methane is generated. Then, typically within less than 1 year, anaerobic (without oxygen) conditions are established and methane-producing bacteria begin to decompose the waste and generate methane. Methane is a greenhouse gas 28 to 36 times more effective than carbon dioxide at trapping heat in the atmosphere over a 100-year period.

<sup>9</sup>U.S. Department of Agriculture, Economic Research Service, *Household Food Security in the United States in 2017*, Economic Research Report No. 256 (Washington, D.C.: September 2018). Food-insecure households (those with low and very low food security) had difficulty at some time during the year providing enough food for all their members due to a lack of resources.

businesses could feasibly provide an additional 1.8 billion meals over the next decade.<sup>10</sup>

FLW has been an issue of concern for decades. For example, we reviewed USDA's FLW reduction efforts in 1977.<sup>11</sup> In September 2015, EPA, which oversees municipal solid-waste management, and USDA, which has overarching objectives related to reducing food insecurity and improving food safety, among other things, announced a national goal to reduce FLW in the United States by 50 percent by 2030,<sup>12</sup> which aligns with Target 12.3 of the United Nations Sustainable Development Goals.<sup>13</sup> EPA and USDA each has its own definition and baseline estimate of FLW that it intends to use to measure progress in reaching the 50 percent FLW reduction goal based on their agency missions.<sup>14</sup> In October 2018, EPA, USDA, and the Food and Drug Administration (FDA), which has food

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<sup>10</sup>ReFED, *A Roadmap to Reduce U.S. Food Waste by 20 Percent*. According to this report, food recovery networks in the United States, including food banks, soup kitchens, shelters, and other agencies, already receive and distribute nearly 1.7 million tons of rescued food each year. However, based on ReFED's analysis, over three times this amount—up to 5.8 million additional tons—could be feasibly recovered from food businesses. ReFED reports that approximately 20 percent of this additional recovery potential, or 1.1 million tons (1.8 billion meals), can be cost-effectively recovered over the next decade.

<sup>11</sup>GAO, *Food Waste: An Opportunity to Improve Resource Use*, CED-77-118 (Sept. 16, 1977). This review focused primarily on the agency's National School Lunch Program and other food assistance programs, and we made a number of recommendations to USDA, including that USDA undertake a comprehensive study of both the magnitude and causes of FLW. USDA agreed with our recommendations at that time. However, in February 2019, USDA officials told us that they were unsure what action, if any, was taken in response to the report.

<sup>12</sup>U.S. Department of Agriculture, Office of Communications, *USDA and EPA Join with Private Sector, Charitable Organizations to Set Nation's First Food Waste Reduction Goals*, Press Release No. 0257.15 (Washington, D.C.: Sept. 16, 2015).

<sup>13</sup>United Nations Sustainable Development Goal 12.3 states: "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses." This goal was one part of a set of 17 Sustainable Development Goals that the United Nations General Assembly adopted in September 2015 as part of the 2030 Agenda for Sustainable Development.

<sup>14</sup>Using available 2010 data, EPA selected a baseline at 218.9 pounds of food waste per person sent for disposal per year. EPA's 2030 FLW reduction goal aims to reduce FLW going to landfills and combusted with energy recovery by 50 percent to 109.4 pounds per person per year. In contrast, USDA's Economic Research Service estimated that the amount of FLW at the retail and consumer levels in 2010 was 31 percent of the food supply, equaling 133 billion pounds and almost \$162 billion. To reach the national goal to reduce FLW by 50 percent, the United States would need to reduce FLW by approximately 67 billion pounds at the retail and consumer levels.



safety responsibilities, among other things, signed a formal agreement aimed at increasing collaboration and coordination on FLW reduction efforts among these agencies.<sup>15</sup> Furthermore, in the Agriculture Improvement Act of 2018, also known as the 2018 Farm Bill, Congress tasked the Secretary of Agriculture with taking a number of actions to address FLW, including conducting studies, and working with local governments, among other things. Nonfederal stakeholders, such as states and municipalities, tribes, international and nonprofit organizations, the food industry, and academic institutions, are also involved with efforts to study and reduce FLW. For example, the Massachusetts Department of Environmental Protection supports residential FLW reduction efforts through grants to cities and towns to promote residential composting, and it implemented a regulation in 2014 that bans commercial entities from disposing of or incinerating food waste at solid waste disposal facilities. In addition, academic institutions, such as Harvard Law School's Food Law and Policy Clinic, have studied FLW issues and worked with stakeholders to identify potential solutions, including working with various states to develop legal fact sheets to help businesses and nonprofit organizations understand the legal liability issues related to food donations.

You asked us to examine the actions federal agencies are taking to address FLW. This report (1) describes nonfederal stakeholder views on key challenges to reducing FLW in the United States, (2) describes actions EPA and USDA have taken to address key challenges to reducing FLW in the United States, and (3) examines federal planning efforts toward achieving the national FLW reduction goal.

To address all our objectives, we reviewed documentation related to FLW by selected federal agencies, including the Centers for Disease Control and Prevention, Congressional Research Service, EPA, FDA, and USDA. We interviewed agency officials from the Centers for Disease Control and Prevention, Congressional Research Service, Council on Environmental Quality (CEQ), EPA, FDA, Office of Management and Budget (OMB), and USDA.

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<sup>15</sup>U.S. Environmental Protection Agency, U.S. Department of Agriculture, and U.S. Food and Drug Administration, *Formal Agreement among the United States Environmental Protection Agency and the United States Food and Drug Administration and the United States Department of Agriculture Relative to Cooperation and Coordination on Food Loss and Waste* (Washington, D.C.: Oct. 18, 2018). The formal agreement is available at <https://www.usda.gov/sites/default/files/documents/usda-fda-epa-formal-agreement.pdf>.

To describe nonfederal stakeholder views on challenges to reducing FLW, we reviewed documentation provided by selected nonfederal stakeholders, such as academic institutions, food industry entities, international organizations, municipalities, nonprofit organizations, states, and a tribal organization and interviewed the stakeholders about their views on such challenges and ways in which federal agencies could potentially address these challenges. For example, we interviewed representatives of the United Nations Food and Agriculture Organization (FAO) about the challenges it faces in developing a methodology for measuring FLW at the national and food supply-chain stage levels.<sup>16</sup>

We identified representatives of these nonfederal stakeholders through interviews with agency officials and through a snowball approach, in which we reviewed stakeholder documents to identify other key stakeholders and asked stakeholders to recommend other key stakeholders for possible inclusion in this review. We selected a nongeneralizable sample of 26 nonfederal stakeholders based on whether the stakeholders had demonstrated expertise on FLW by conducting research or drafting reports about FLW issues at one or more of the food supply-chain stages or by participating in FLW reduction activities. Nonfederal stakeholders that met these selection criteria but were not selected were excluded only due to time and resource limitations. We conducted a thematic analysis of our interviews to identify common patterns of challenges. Specifically, we reviewed nonfederal stakeholder responses to our interview questions and grouped them into categories of challenges that EPA, FDA, and USDA may be able to address. Because this is a nongeneralizable sample, the views of these nonfederal stakeholders do not represent the views of all stakeholders who study FLW or who have made efforts to reduce FLW, but they provide illustrative examples of challenges to reducing FLW and ways in which federal agencies could address these challenges.

We also conducted site visits to businesses and institutions in Massachusetts that are taking steps to reduce FLW. These site visits were selected and organized by the Center for EcoTechnology, a nonfederal stakeholder that we had previously interviewed, to provide

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<sup>16</sup>FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger. FAO and the United Nations Environmental Program share responsibility for developing indicators in support of the United Nations Sustainable Development Goal Target 12.3 on FLW. FAO is the custodian of a subindicator of food loss and the United Nations Environmental Program is the custodian of a subindicator of food waste.

illustrative examples of ongoing FLW reduction efforts at the different stages of the food supply chain.<sup>17</sup> For example, we visited a farm in Massachusetts that had collaborated with an energy company to develop an anaerobic digestion facility to process FLW from local farms and other sources.<sup>18</sup> In addition, we toured a grocery store, hospital, university, and restaurant that are each taking steps to reduce FLW through efforts such as more efficient ordering, food donations to charitable organizations, and composting.

We also attended various conferences and workshops dealing with FLW.<sup>19</sup> During these events, we used convenience sampling (i.e., interviewing attendees that were available for discussions) to capture a broad range of perspectives across actors and sectors of the food supply chain. These discussions were included for contextual sophistication, but not for evidentiary purposes.

To examine actions EPA and USDA have taken to address the challenges with reducing FLW in the United States, we reviewed EPA and USDA reports, such as EPA's Advancing Sustainable Materials Management Fact Sheet reports<sup>20</sup> and a 2014 USDA report on food loss estimates.<sup>21</sup> We also reviewed relevant legislative documents, such as the Committee on Appropriations House Report 115-232 accompanying H.R. 3268, which directs USDA's Economic Research Service to conduct

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<sup>17</sup>The Center for EcoTechnology is a nonprofit organization engaged in FLW reduction at the national, state, and local levels.

<sup>18</sup>Anaerobic digestion is a recycling technology in which organic waste (such as food or yard waste) decomposes in a closed vessel without oxygen, generating both biogas and material that can be composted and returned to the soil. Biogas is combusted to generate electricity and heat; it can also be processed into renewable natural gas and transportation fuels.

<sup>19</sup>2018 New York State Organics Summit (Mar. 27–28, 2018); 2018 U.S. Food Waste Summit (June 26–27, 2018); 2018 Midwest Food Recovery Summit (Sept. 11–13, 2018); Environmental Law Institute's "American Waste: Paradigm Shifting Toward a Circular Economy" (Oct. 4, 2018); and National Academies of Sciences, Engineering, and Medicine's Science and Technology for Sustainability Program, "Reducing Food Loss and Waste: A Workshop on Impacts" (Oct. 17, 2018).

<sup>20</sup>Each year, EPA produces a report called *Advancing Sustainable Materials Management: Fact Sheet*, formerly called *Municipal Solid Waste in the United States: Facts and Figures*. It includes information on municipal solid-waste generation, recycling, combustion with energy recovery, and landfilling.

<sup>21</sup>USDA, *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*.

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a study that describes the quantity and types of produce wasted on farms, barriers to recovering that produce, and new market opportunities to increase recovery and farmers' income. We also reviewed USDA's Strategic Plan and other documentation on USDA's programs, studies, and activities.

To assess federal efforts to plan toward achieving the national FLW reduction goal, we reviewed and analyzed relevant laws and EPA, USDA, and FDA policies, guidance, program information, and planning documentation related to FLW. We also interviewed the selected nonfederal stakeholders to determine the extent to which they have collaborated with EPA, USDA, and FDA on FLW issues. We focused on EPA, USDA, and FDA because these agencies made a commitment to coordinate federal efforts to achieve the national FLW reduction goal. In addition, we compared EPA, USDA, and FDA's collaborative efforts for planning to achieve the national FLW reduction goal to practices for enhancing interagency collaboration that we identified in prior work.<sup>22</sup>

We conducted this performance audit from December 2017 to June 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### Federal Roles and Responsibilities Related to FLW Vary

In 2015, the President signed Executive Order 13693, "Planning for Federal Sustainability in the Next Decade." This executive order called for federal agencies to, among other things, advance waste prevention and pollution prevention in federal facilities, operations, and vehicles by

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<sup>22</sup>GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005); *Managing For Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012); *Managing for Results: Implementation Approaches Used to Enhance Collaboration in Interagency Groups*, [GAO-14-220](#) (Washington, D.C.: Feb. 14, 2014).

diverting at least 50 percent of nonhazardous solid waste, including food and compostable material, but not construction and demolition debris, in their internal operations annually, and pursue opportunities for net-zero waste or additional diversion opportunities. In May 2018, Executive Order 13693 was revoked and replaced by Executive Order 13834, "Efficient Federal Operations," which directed federal agencies to implement waste prevention and recycling measures but no longer included the specific direction to divert at least 50 percent of nonhazardous solid waste, including food and compostable material, annually or to pursue opportunities for net-zero waste or additional diversion opportunities. CEQ and OMB are responsible for implementing and tracking progress for these executive orders.

Among its duties, EPA oversees municipal solid-waste management. For example, EPA regulates the management of household, industrial, and manufacturing solid and hazardous wastes under the Resource Conservation and Recovery Act. The objectives of the act include protecting the United States from the hazards of waste disposal, to conserve energy and natural resources by recycling and recovery, and to minimize the generation of hazardous waste. However, the management of nonhazardous solid waste, such as food waste, is left primarily to the states and local governments. Under the act, EPA established solid-waste management guidelines for municipalities that encouraged recycling, including composting food and yard waste. EPA's Sustainable Materials Management Program, including the Sustainable Management of Food strategic priority area, seeks to reduce the environmental impact of materials through their entire life cycle. Furthermore, available landfill space is decreasing in various parts of the United States; EPA's FLW activities may help extend the life of those existing landfills and provide opportunities for energy generation.

According to USDA officials, USDA has developed a broad range of programs and policies to reduce FLW as a means to support its overarching objectives related to reducing food insecurity, improving food safety,<sup>23</sup> increasing market efficiencies, and enhancing farmer income and rural development. USDA also conducts education and outreach through its network of state and local offices, the Cooperative Extension Service, state Departments of Agriculture, land-grant university partners,

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<sup>23</sup>USDA is responsible for ensuring that the meat, poultry, and processed eggs supply is wholesome, safe, and properly labeled.

and nongovernmental, nonprofit, community, and faith-based organizations.<sup>24</sup> Additionally, the 2018 Farm Bill requires the Secretary of Agriculture to take a number of actions to address FLW: (1) create a FLW Reduction Liaison to coordinate federal, state, local, and nongovernmental programs, and other efforts, to measure and reduce the incidence of FLW; (2) conduct a study on food waste in consultation with the FLW Reduction Liaison and report data collected on food waste and efforts to reduce and prevent such waste; (3) issue guidance outlining the best practices to minimize food waste for donated commodities; (4) enter into cooperative agreements with local or municipal governments to develop and test strategies for planning and implementing municipal compost plans and food waste reduction plans; (5) establish a milk donation program to encourage the donation of milk products produced and processed in the United States, assist individuals in low-income groups, and reduce food waste; and (6) establish a Local Agriculture Market Program to, among other things, promote new business opportunities and marketing strategies to reduce on-farm food waste.

Finally, FDA, which is responsible for, among other things, overseeing the safety of about 80 percent of the nation's food supply, has a limited mission related to FLW.<sup>25</sup> FDA was not involved with establishing the national FLW reduction goal in 2015 but, according to agency officials, has become more engaged in consumer education and outreach to the food industry, hunger relief and food rescue organizations, state and local governments, academia, and other stakeholders on issues related to FLW. By signing the 2018 formal agreement on collaboration and coordination with EPA and USDA, FDA has committed to taking further actions to reduce FLW.

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<sup>24</sup>GAO, *Climate Change: USDA's Ongoing Efforts Can Be Enhanced with Better Metrics and More Relevant Information for Farmers*, [GAO-14-755](#) (Washington, D.C.: Sept. 16, 2014). Established by the Smith-Lever Act of 1914, the cooperative extension system is a nationwide system used to disseminate information and research developed at land-grant universities.

<sup>25</sup>FDA is responsible for protecting and promoting public health by (1) ensuring the safety of food and animal feed, cosmetics, and radiation emitting products; (2) ensuring the safety, effectiveness, and security of human and animal drugs, biological products, and medical devices; and (3) regulating tobacco products. Regarding food safety and nutrition specifically, the mission of the agency's Office of Foods and Veterinary Medicine Program is to promote human health by preventing foodborne illness and fostering good nutrition. Among other things, FDA has the authority under the Federal Food, Drug, and Cosmetic Act to seek an order to remove any food from the market if the food is unsafe. The agency can also pursue enforcement action against those marketing such a food.

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## Varying Definitions Inform Methodologies for Measuring Food Loss and Waste

Definitions of FLW vary among the various organizations, including federal agencies, working in this area, which inform different methodologies for measuring and reporting FLW. For example, consistent with its focus on advancing the sustainable use of materials, including food, throughout their life cycle to minimize waste and environmental impacts, EPA uses the term “wasted food” instead of “food waste” for food that is not used for its intended purpose because it conveys that a resource with value is being wasted, whereas “food waste” implies that the food no longer has value and needs to be managed as waste.<sup>26</sup> EPA states that “wasted food” is managed in a variety of ways, including through donations to food banks, conversion to animal feed, composting, anaerobic digestion, or sending it to landfills. In contrast, USDA’s Economic Research Service (ERS) defines food loss as edible food that is available for human consumption but that is not eaten.<sup>27</sup> According to ERS, food losses may occur for any number of reasons, including cooking loss and natural shrinkage; loss from mold, pests, or inadequate climate control; and plate waste, which refers to edible food that is served but discarded. In addition, ERS defines food waste as a component of food loss that refers to food discarded by retailers and consumers due to quality concerns, such as blemished food. ERS takes this approach in support of its effort to estimate the nation’s available food supplies, which it adjusts to account for nonedible parts of foods and losses throughout the food supply chain.

USDA has noted that definitions of FLW vary worldwide. For example, FAO differentiates food loss from food waste based on the stage of the food supply chain in which the amount of edible food decreased. FAO refers to food loss as the decrease in edible food that occurs throughout the production and processing stages of the food supply chain, whereas food waste occurs at retail and consumer stages of the food supply chain.

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<sup>26</sup>Environmental Protection Agency, *Sustainable Management of Food Basics*, accessed February 15, 2019, <https://www.epa.gov/sustainable-management-food/sustainable-management-food-basics#what>.

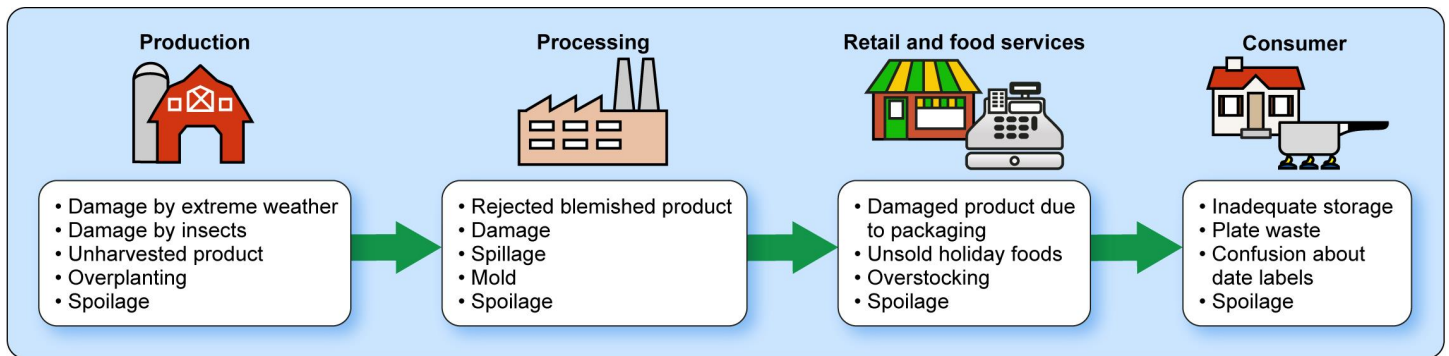
<sup>27</sup>USDA, *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*.

These varying definitions have led to different methodologies for measuring and reporting FLW. For example, EPA estimates the amount of food from residences, commercial establishments (such as grocery stores), and institutional establishments (such as schools) that is disposed of through landfills or converted to energy, while ERS estimates the amount, value, and calories of postharvest food losses at the retail and consumer stages of the food supply chain. In addition, ERS and FAO FLW estimates do not include inedible parts, whereas, with its focus on materials management, EPA’s estimates do.

### Food Loss and Waste Occurs throughout the Food Supply Chain, and Options to Reduce It Vary

FLW can occur across the entire food supply chain, occur at more than one stage (e.g., spoilage), or be unique to a specific stage, as seen in figure 1 below. However, the share of total FLW due to each of these causes is currently unknown, according to a USDA report.<sup>28</sup>

**Figure 1: Food Supply-Chain Stages and Examples of Causes of Food Loss and Waste**



Source: GAO analysis of U.S. Department of Agriculture Economic Research Service data. | GAO-19-391

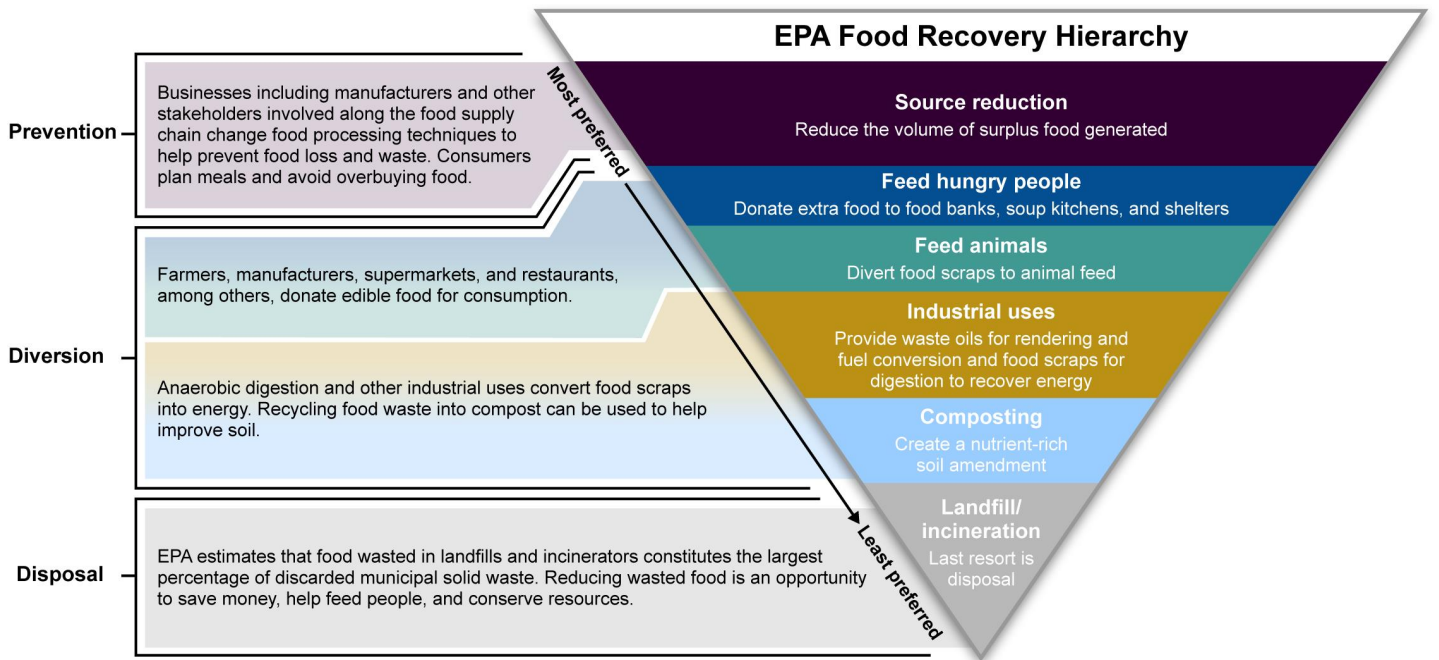
EPA’s Food Recovery Hierarchy, shown in figure 2 below, focuses on different options for reducing FLW. According to EPA, the top levels of the hierarchy are the best ways to reduce FLW because they create the most benefits for the environment, society, and the economy. Source reduction is the preferred option for reducing FLW because it provides the greatest benefits in terms of environmental sustainability. This is because growing food requires resources, such as land, water, fertilizer, and pesticides. In

<sup>28</sup>USDA, *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*.



contrast, food that is sent to landfills generates greenhouse gases, such as methane.<sup>29</sup>

**Figure 2: Environmental Protection Agency’s Food Recovery Hierarchy**



Sources: Environmental Protection Agency (EPA) and GAO analysis of EPA information. | GAO-19-391

- Prevention refers to reducing the amount of surplus food generated at any stage of the food supply chain. For example, businesses, such as restaurants, may prevent FLW through better planning and food preparation techniques.
- Diversion includes recovering food by donating edible food to feed hungry people or sending food scraps to feed animals. Diversion also includes recycling food scraps for industrial uses, such as waste-to-energy generation or anaerobic digestion, or for composting.

<sup>29</sup>According to a senior USDA official, hierarchies that prioritize source reduction and feeding people over industrial uses or composting incorporate efficiency as well as food-security objectives. They reflect the observation that it is generally inefficient to use food produced to feed people as animal feed or as inputs to industrial uses or composting since the same or fewer resources could have been used to produce nutritionally balanced animal feed, feedstocks for industrial use, and high-value soil amendments (i.e., materials that are applied to land primarily to enhance soil characteristics rather than as plant food).

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- Disposal refers to food that is sent to landfills, incinerators, or washed into sewers.

According to USDA, some FLW is inevitable and, therefore, entirely eliminating FLW is unrealistic.<sup>30</sup> For example, USDA ERS reports that there is a practical limit to how much FLW in the United States could be reduced, given different factors, such as food safety concerns, the perishability of foods, storage and temperature considerations, and risk management for production and marketing uncertainties, and resource constraints to recover uneaten food for another use, among others. According to USDA officials, to be successful, FLW reduction strategies should consider the economic incentives and disincentives faced by stakeholders across the food supply chain.

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## Nonfederal Stakeholders Cited Various Challenges to Reducing Food Loss and Waste in the United States

Nonfederal stakeholders we interviewed cited various challenges that exist to reducing FLW in the United States. Through our analysis of those interviews, we identified three key areas: (1) limited data and information about the amounts and causes of FLW; (2) a lack of awareness and education about FLW; and (3) limited infrastructure and capacity, which can hamper efforts to reduce FLW. In some instances, the nonfederal stakeholders also provided their views for ways federal agencies could potentially address the identified challenge areas.

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### Nonfederal Stakeholders Said Data and Information about Amounts and Causes of FLW Are Limited

Through interviews with nonfederal stakeholders, we identified limited data and information about the amounts and causes of FLW as a challenge to reducing FLW in the United States. For example, several stakeholders told us that data gaps associated with the different food supply-chain stages make it challenging to estimate FLW. For example:

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<sup>30</sup>USDA, *The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States*.

- An international organization published a study in 2011 that included estimates of FLW by different regions and different stages of the food supply chain. The organization reported in its study that there were major data gaps in the knowledge of global FLW, such as the causes of FLW. Representatives of this organization told us that a challenge to measuring and estimating FLW is the lack of data on the various stages of the food supply chain. They are proposing a new methodology intended to help countries measure FLW along the supply chain in a cost-effective manner and monitor progress in reducing FLW.
- Researchers from two academic institutions told us there are challenges to estimating farm-production food losses. For example, researchers from one of these academic institutions told us that farm-production losses fluctuate from year to year based on changes in markets and growing conditions, such as weather, which can make estimating FLW more challenging. In addition, these researchers told us more information is needed about how different economic factors, such as the existence of secondary (alternative) markets to sell excess food,<sup>31</sup> or changes in farming costs such as increases in labor costs, may influence FLW.
- One nonprofit organization reported that data at the farm-production stage of the food supply chain are limited, including data on what happens to some food at that stage. For example, there are limited data about whether produce that goes unsold is tilled back into the farmland, composted, or sent to a landfill. This nonprofit organization reported the limitations of its estimate of FLW across the food supply chain in the United States.<sup>32</sup> For example, the nonprofit organization documented in its FLW estimate methodology that its farm-production FLW data analysis focused on estimating imperfect-produce rates, but noted that FLW may occur at this stage for a variety of reasons, including inclement weather, pests, or overproduction. It also documented that future research efforts could assess actual produce imperfection and loss rates for each produce type using geographical differences to improve estimate accuracy.
- Representatives from another nonprofit organization that has published an estimate of FLW told us there are data gaps about FLW along the food supply chain. For example, this nonprofit organization

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<sup>31</sup>An example of a secondary market is CropMobster, a community exchange that addresses FLW and food surpluses with online tools.

<sup>32</sup>ReFED, *A Roadmap to Reduce U.S. Food Waste by 20 Percent*.

reported in 2017 that improved research is needed regarding farm-production data and FLW estimates of the consumer stage of the food supply stage.<sup>33</sup> In addition, this nonprofit organization reported that one challenge is the absence of standardized measurement methodologies and common metrics to help entities representing all food supply-chain stages accurately estimate FLW, develop strategies to reduce FLW, and measure progress. In this report, they noted that federal agencies' efforts to develop a mechanism to aggregate and disseminate FLW information as it is gathered by businesses and institutions, among others, would be beneficial to all stakeholders.

- Representatives of a third nonprofit organization stated that FLW measurement methodologies need to be tailored to the particular stages of the food supply chain and that the strategies to reduce FLW need to respond to the conditions associated with specific foods.

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### Nonfederal Stakeholders Identified a Lack of Education and Awareness about FLW

Nonfederal stakeholders identified a lack of education and awareness about FLW as a challenge to reducing FLW. For example, an official from one state told us that there is a lack of awareness among various organizations about the benefits of preventing FLW. Specifically:

- One state official told us that there is a lack of awareness among food producers, businesses, and consumers about the benefits of preventing FLW. According to this official, to address this challenge the state developed a strategic action plan that prioritizes focusing upstream in the food supply chain to prevent FLW, as opposed to the more traditional focus on increasing FLW diversion, such as through composting. This official also told us that implementing organic waste (e.g., food waste or other plant and animal materials) bans, which prohibit specified waste generators from sending food waste to landfills, as several states are doing to reduce FLW, tends to promote FLW reduction activities further down on EPA's Food Recovery Hierarchy. As a result, organic waste bans may contribute relatively little to reducing FLW or maximizing the benefits of such reductions. This official emphasized that additional steps are needed to increase awareness about the benefits of prioritizing prevention through shifts

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<sup>33</sup>Natural Resources Defense Council, *Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*.

in supply chains, purchasing, and consumption patterns to reduce FLW.

- Officials from two states told us there is a lack of resources to support efforts to educate consumers about FLW. For example, one state official told us that the state agency has insufficient staff resources to do effective outreach regarding FLW, and current staff members do not yet have the expertise to fully educate and assist consumers and businesses about all options available to reduce FLW. Another state official told us that the state would like to do a state-wide social marketing campaign to disseminate education and information about FLW to household consumers, but the state lacks sufficient resources to launch such an effort.
- Representatives of a nonprofit food donation organization identified a lack of education and awareness about date labeling as one of the challenges to reducing FLW.<sup>34</sup> For example, the representatives told us that consumer confusion about date labels may be an impediment to reducing FLW among consumers.<sup>35</sup> However, in these representatives' view, reducing date labeling confusion is unlikely to lead to additional food donations. In addition, an academic institution representative, in collaboration with other authors, reported that a driver of household FLW is consumer confusion over date labels and conducted a survey to gain information about consumer perceptions of date labels. They concluded from their research that increasing consumer education on the meaning of date labels can help to reduce FLW.
- A representative of a nonprofit food donation organization told us that education and awareness about liability protections and compliance are lacking for various potential food donors and may hinder some food producers from donating food and, by extension, reducing FLW.

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<sup>34</sup>Food manufacturers use date labeling such as "sell by" or "use by" to communicate the estimated time for which the food product will be of best quality.

<sup>35</sup>GAO expects to issue a report on date labeling in 2019 ([GAO-19-407](#)) that will focus on this issue.

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## Nonfederal Stakeholders Said Limited Infrastructure and Capacity Can Hamper Efforts to Reduce FLW

Through interviews with nonfederal stakeholders, we identified that limited infrastructure and capacity is a challenge that can hamper efforts to reduce FLW. For example:

- Representatives of a nonprofit food donation organization that receives food donations cited a lack of sufficient capacity and logistical support to collect and distribute available food. For example, representatives told us that food pantries may not have a sufficient volunteer workforce or enough food storage capacity to be able to distribute all donated food to needy people.
- Food industry representatives told us that businesses have infrastructure limitations, such as a lack of transportation options to deliver excess food to food pantries or composting facilities. For example, representatives told us that if such facilities were available, food scraps, such as produce peels, could be used as animal feed or composted. However, if the infrastructure to utilize these options is not available, the companies generating the FLW may opt to send it to landfills instead.
- An official from one state told us that the state does not have access to the infrastructure and capacity needed to separate contaminants in order to be able to divert FLW for other uses, such as animal feed, composting, or anaerobic digestion. For example, this state official told us that the state does not have access to the necessary equipment to separate plastic and other packaging materials from food waste in order to be able to process FLW through anaerobic digesters. Officials of another state provided a study stating that removing packaging from food waste can be an obstacle to successful FLW diversion and that separation of food waste for composting or other diversion can be costly. In addition, a representative of one international organization told us that federal agencies could facilitate a collaborative approach with industry stakeholders to develop voluntary industry standards on food packaging materials and food portion sizes to help reduce FLW in the United States.<sup>36</sup>

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<sup>36</sup>The Waste Reduction and Action Programme, an international nonprofit organization that works with the United Kingdom government and the private sector to reduce FLW, developed the “Courtauld Commitment,” a voluntary agreement for the grocery sector, to improve resource efficiency and prevent food and packaging waste in the home and food supply chain.

- Officials from another state told us that a lack of food recycling infrastructure limits their ability to enforce the state's organic waste ban and reduce FLW. A state official told us that the state has one anaerobic digester facility to process food waste, but additional recycling infrastructure would be needed statewide to enable food waste generators, such as hospitals or schools, to recycle their food waste instead of sending it to landfills.

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## EPA and USDA Have Taken Initial Actions to Address Key Challenge Areas to Reducing Food Loss and Waste

Since announcing the national FLW reduction goal in 2015, EPA and USDA have taken initial actions to address challenges in the three key areas that nonfederal stakeholders identified to reduce FLW. For example, EPA and USDA have taken actions to provide improved data and information about FLW in the United States; educate and increase awareness of FLW along the food supply chain; and expand the infrastructure and capacity to support efforts to reduce FLW.

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## EPA and USDA Have Provided Some Data and Information on Food Loss and Waste in the United States

EPA and USDA have provided some data and information about FLW in the United States. Specifically:

- In a 2018 report, EPA published trends of food waste materials generation, among other materials, and provided updated information about municipal solid waste being generated, recycled or composted, landfilled, and combusted with energy recovery using 2015 data from residential, commercial, and institutional sources.<sup>37</sup> According to EPA, food waste represents the largest percentage of landfilled material in municipal solid waste, as seen in figure 3 below.<sup>38</sup> EPA relies on gathering these data on food waste generation and management from

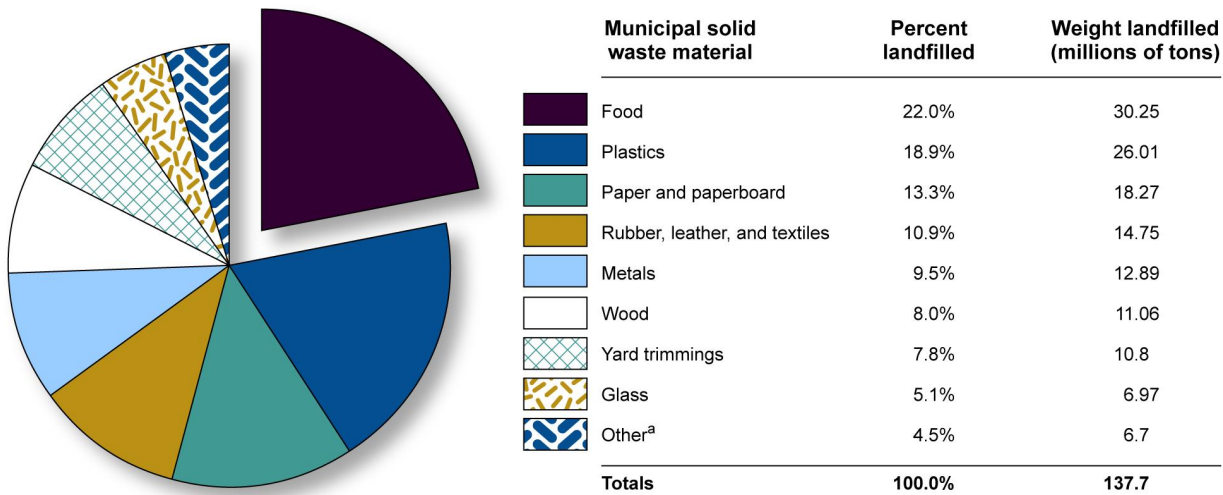
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<sup>37</sup>EPA has collected and reported data on the generation and disposition of municipal solid waste in the United States for more than 30 years.

<sup>38</sup>U.S. Environmental Protection Agency, *Advancing Sustainable Materials Management: 2015 Tables and Figures* (Washington, D.C.: July 2018).

studies conducted by other organizations, such as state and local governments and food waste generators.

**Figure 3: EPA Total Municipal Solid Waste Landfilled by Material, 2015**



Source: Environmental Protection Agency (EPA). | GAO-19-391

<sup>a</sup>Other waste includes miscellaneous inorganic waste and other product materials, such as electrolytes in batteries.

- EPA measures certain FLW diversion activities (i.e., divert food to a destination other than landfill or incineration). For example, in September 2018 EPA completed an effort to quantify the number and capacity of anaerobic digestion facilities in the United States.<sup>39</sup> EPA also aggregates and publishes data submitted by EPA’s Food Recovery Challenge program participants on recycling fats, oils, and grease, which may otherwise be disposed of through wastewater. For example, participating restaurants may submit data on the amount of fats from their fryer grease containers that they send for recycling through rendering, conversion to biofuels, or to an anaerobic digester. In addition, EPA develops estimates of food waste composting based on a review of state environmental agency websites, as well as published reports.
- EPA updates its FLW estimates annually. EPA officials stated that these annual estimates are the most comprehensive annual estimates of generated and managed FLW and that EPA plans to use these

<sup>39</sup>U.S. Environmental Protection Agency, *Anaerobic Digestion Facilities Processing Food Waste in the United States in 2015 Survey Results*, EPA/903/S-18/001 (Washington, D.C.: September 2018).



estimates to track progress. However, EPA officials acknowledged certain limitations in using these estimates to track annual progress against the 2030 goal. For example, EPA officials stated that data challenges include limited studies available for some sectors and the lack of geographic coverage, among others. EPA is taking steps to improve its FLW estimates. For example, officials stated that in 2017 EPA embarked on an effort to improve its food measurement methodology to reflect all potential FLW generating sectors for which there are data, and to characterize how food is being managed beyond composting and landfill.

USDA has also provided some data and information about FLW at various stages of the food supply chain in the United States since 2015. Specifically:

- ERS is working on initiatives to refine and improve its data system in order to support its ongoing efforts to estimate FLW at the retail and consumer stages of the food supply chain. For example, USDA officials told us they are developing a proposal for an external expert panel to analyze food loss estimates at the consumer stage of the food supply chain and make recommendations for data updates. In addition, USDA officials told us that work is under way to update the retail-level loss estimates of selected foods.
- In addition, in December 2017, ERS initiated work on a study to identify gaps in information about farm-level FLW.<sup>40</sup> According to ERS officials, as part of the study, ERS will describe the existing data-collection challenges and address the economic factors that influence farmers' decisions as they relate to FLW at the farm level. For example, one factor could involve a farmer deciding to plow excess produce into the fields instead of harvesting or processing the crop if the potential additional labor or operations costs exceed the potential revenue. One senior ERS official told us that ERS expects to issue the study by the end of calendar year 2019. Additionally, ERS officials told us that USDA could use the final study to inform USDA's policy approaches to reducing FLW. For example, the report may inform USDA's efforts to assist farmers in implementing best practices in reducing FLW and expanding market opportunities for imperfect fruits and vegetables or excess harvest.

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<sup>40</sup>According to USDA officials, this study is in response to House Report 115-232, which directed ERS to conduct a study about on-farm food losses. H.R. Rep. No. 115-232, at 15 (2017).

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- USDA’s National Institute for Food and Agriculture has provided grant funding to projects related to FLW. For example, the institute awarded a grant in 2018 to an academic institution to study the effect of secondary markets as alternative channels for usable food.<sup>41</sup>
  - To advance the research mission of the agency, among other reasons, USDA has a memorandum of understanding with the Foundation for Food and Agriculture Research, an organization that Congress authorized as part of the 2014 Farm Bill. The Foundation for Food and Agriculture Research conducts research in six defined challenge areas, including one area that focuses research on inefficiencies in the food system, such as FLW.

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<sup>41</sup>Timothy J. Richards and Stephen F. Hamilton, “Food Waste in the Sharing Economy,” *Food Policy*, vol. 75 (2018). This study funded by the institute described a secondary market as an alternative channel for a food producer to distribute usable food (e.g., imperfect produce) to consumers in lieu of discarding the food.

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## EPA and USDA Have Taken Some Actions to Educate and Build Awareness about Food Loss and Waste

EPA and USDA have taken some actions to educate and build awareness about FLW in the United States since announcing the national FLW reduction goal in 2015. For example, EPA published its *Sustainable Materials Management Program Strategic Plan, Fiscal Years 2017-2022* in October 2015.<sup>42</sup> One of the plan's three strategic priority areas is Sustainable Food Management, which includes an action area of promoting opportunities to reduce wasted food and the food's associated effects over the entire food supply-chain life cycle with a preference for using approaches that are higher on the agency's Food Recovery Hierarchy. EPA's strategic plan describes delivering tools and education; working with states and local communities to help provide regional or sector-based support; and sharing best practices on wasted-food reduction efforts. In addition to the planned actions identified in the Sustainable Food Management area, EPA has also provided the following FLW education and awareness tools, among others:

- **Food: Too Good to Waste.** This community-based social marketing campaign, implementation guide, and toolkit aim to reduce wasteful household food management practices and keep FLW out of landfills. The toolkit is designed for community organizations, local governments, households, and others interested in reducing wasteful household food management practices. The implementation guide is designed to teach local governments and community organizations how to implement a Food Too Good to Waste campaign in their community using the toolkit. In a 2016 report, EPA listed 17 communities in various states, including Rhode Island and Vermont, that had implemented Food Too Good to Waste campaigns and, as part of this implementation, could use outreach and engagement tools adaptable to the needs of their communities based on their available resources. The campaigns focused on helping households make small shifts in how they shop, prepare, and store food to prevent it from being wasted.
- **Waste Reduction Model.** According to the agency's website, EPA created this tool to help solid-waste planners and organizations track greenhouse gas emissions reductions from several different waste-

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<sup>42</sup>U.S. Environmental Protection Agency, *U.S. EPA Sustainable Materials Management Program Strategic Plan, Fiscal Years 2017-2022* (Washington, D.C.: October 2015).

management practices, including source reduction, recycling, anaerobic digestion, combustion, composting, and landfilling. For example, a food service establishment can use the tool to create an estimate of the greenhouse gas savings associated with decreasing the amount of bread and produce landfilled.

- **Tip sheets.** EPA developed tip sheets about reducing FLW for different sectors involved in the food supply chain, including manufacturers and restaurants, to emphasize FLW prevention options. EPA officials told us that they make these tip sheets available online on the agency's website and attend conferences to disseminate information. For example, the officials said that they attended the Midwest Food Recovery Summit in September 2018 and provided these tip sheets at the EPA information booth during the conference.

In addition, USDA has been involved in the following FLW reduction efforts to raise awareness and educate various stakeholders along the food supply chain:

- **FLW roundtable meeting.** In May 2018, the Secretary of Agriculture hosted a roundtable meeting with members of Congress, food industry representatives, and nonprofit groups to raise awareness about FLW and discuss potential solutions.
- **FoodKeeper application.** In 2015, USDA, in partnership with Cornell University and the Food Marketing Institute, launched the FoodKeeper application, a tool to provide consumers with specific storage advice, including storage timelines for the refrigerator and freezer for food and beverage items.<sup>43</sup> USDA officials stated that the agency updated the application in October 2018 to include various features including searching for food and beverages in Spanish and increasing the number of food items with storage information. USDA has continued to highlight the FoodKeeper application as part of USDA and EPA's Food Waste Challenge effort to help educate consumers to reduce FLW.
- **Infographic.** Also in 2015, the USDA Center for Nutrition Policy and Promotion issued an infographic, "Let's Talk Trash," to help inform American consumers about the benefits of reducing FLW, as shown in

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<sup>43</sup>The Food Marketing Institute is an organization that represents food retailers and wholesalers and develops and promotes policies, programs, and forums supporting its members, their customers and supplier partners, and other industry stakeholders.

figure 4.<sup>44</sup> USDA made the infographic available on its [www.choosemyplate.gov](http://www.choosemyplate.gov) website, which includes additional resources to help consumers think about the amount of FLW at home.

**Figure 4: U.S. Department of Agriculture “Let’s Talk Trash” Infographic**



Source: U.S. Department of Agriculture. | GAO-19-391

- Strategies for schools.** In 2015, USDA’s Food and Nutrition Service<sup>45</sup> issued a summary of strategies for schools to reduce FLW that included a list of resources to encourage FLW diversion by donating uneaten food to nonprofit institutions and information about composting. The Food and Nutrition Service also recommended that schools introduce “share tables” into cafeterias so that students could exchange unwanted but otherwise edible food items. In June 2016, USDA issued a memorandum to remind states’ Child Nutrition

<sup>44</sup>U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, *Let’s Talk Trash* (September 2015), accessed December 27, 2018, <https://www.choosemyplate.gov/sites/default/files/printablematerials/2015-LetsTalkTrash-2page.pdf>. The complete infographic comprises two pages, and the second page provides shopping, storage, and cooking practices suggestions to reduce FLW. For example, one suggested practice is to reuse leftover foods in recipes such as adding broccoli stems to a salad.

<sup>45</sup>USDA’s Food and Nutrition Service works to end hunger and obesity through the administration of 15 federal nutrition assistance programs, including the National School Lunch Program.

Program directors of the opportunities to use share tables to reduce FLW in a number of Child Nutrition Programs, such as the National School Lunch Program.<sup>46</sup> In July 2016, the Food and Nutrition Service issued guidance directed at school staff members and students, among others, with tips to prevent FLW, including encouraging students to use share tables.<sup>47</sup>

To further provide information, raise awareness, and educate different stakeholders along the food supply chain, EPA and USDA have collaborated on the following FLW reduction efforts:

- **A Guide to Conducting Student Food Waste Audits.** In 2017, EPA, USDA, and the University of Arkansas collaborated to create this guide for students and school personnel about the amount of FLW in their cafeterias. The guide provides information on why and how to do a food waste audit and what to do with the data collected. It also offers FLW prevention ideas.
- **Public/private partnerships.** EPA and USDA support public/private partnerships to provide key information, solutions, and best practices to reduce FLW across the food supply chain. For example, EPA and USDA established the U.S. Food Loss and Waste 2030 Champions initiative in November 2016 as a way to increase efforts to meet the national FLW reduction goal. This 2030 Champions initiative recognizes organizations that have committed to cutting FLW in their own operations in half by 2030 and encourages Champions to report on their progress. In May 2018, EPA hosted a public webinar to highlight the actions of three 2030 Champions to share best practices, tools, and resources these organizations created to prevent food from going to waste. In March 2019, USDA officials told us that eight additional businesses have joined the 15 Champions involved in the initiative since its launch. In addition, EPA and USDA also support Further With Food, an online hub developed by EPA, USDA, and 10

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<sup>46</sup>A “share table” is a strategy by which students can return their food or beverage items, such as milk and prepackaged items, to be available to other students.

<sup>47</sup>U.S. Department of Agriculture Food and Nutrition Service, *What You Can Do To Help Prevent Wasted Food* (July 2016).

other organizations that provides information and solutions to raise public awareness and reduce FLW.<sup>48</sup>

- **Participation in external conferences.** EPA and USDA have conducted outreach, including through participation in conferences and seminars, and have disseminated resources related to FLW. For example, EPA and USDA each sent an official to attend and present at the National Academies of Science's Reducing Food Loss and Waste: A Workshop on Impacts in October 2018. USDA officials told us they helped fund this workshop and helped develop the workshop's objectives, which were to explore the effects of reducing FLW on food availability and other factors; to examine the role of governments, nongovernmental organizations, and the private sector in adopting best practices to improve the benefits and reduce the costs of reducing FLW; and to discuss opportunities for partnerships to address FLW.

USDA has also collaborated with FDA to address FLW. For example, USDA and FDA are both on the Executive Board of the Conference for Food Protection, an organization that brings together representatives from the food industry, government, academia, and consumer organizations to identify and address emerging problems of food safety. In April 2016, this group released a Comprehensive Resource for Food Recovery Programs to reduce FLW through the recovery of consumable food. This report is intended to assist stakeholders involved in the recovery, distribution, or service of food to people who are food insecure. The report references the national food standards at the retail level, as expressed in the FDA Food Code, to minimize the occurrence of risk factors that contribute to foodborne illness.<sup>49</sup> FDA contributed to the submission of an issue to the 2018 Biennial Meeting of the Conference for Food Protection that sought to promote uniformity in the way in which state and local governments regulate food donation and recovery

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<sup>48</sup>Further With Food, <https://furtherwithfood.org/>, was initiated and is supported by a public-private partnership composed of the Academy of Nutrition and Dietetics, Feeding America, the Food Marketing Institute, the Grocery Manufacturers Association, the Innovation Center for U.S. Dairy, the National Consumers League, the National Restaurant Association, the Natural Resources Defense Council, USDA, EPA, the World Resources Institute, and the World Wildlife Fund.

<sup>49</sup>FDA publishes the Food Code, a model that assists all levels of government by providing them with a scientifically sound technical and legal basis for regulating the retail and food service segment of the industry (restaurants, grocery stores, and institutions, such as nursing homes). According to FDA's website, local, state, tribal, and federal regulators use the Food Code to develop or update their own food safety rules and to be consistent with national food regulatory policy.

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operations in retail and foodservice establishments.<sup>50</sup> In addition, FDA has disseminated information to the public about strategies to reduce FLW while maintaining food safety and has referred to USDA's FoodKeeper application as a resource for learning how to store perishable food and employ safe storage practices.

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## EPA and USDA Have Taken Some Actions to Increase Infrastructure and Capacity to Support Efforts to Reduce FLW

EPA and USDA have each taken some actions to increase infrastructure and capacity to support efforts to reduce FLW in the United States.

EPA has taken some actions to increase infrastructure and capacity to reduce FLW in the United States. For example:

- **Technical assistance.** EPA provides technical assistance to state and local governments in developing anaerobic digestion projects, a technology to process wasted food that is more desirable than landfilling or incineration, according to EPA's Food Recovery Hierarchy.
- **Excess Food Opportunities Map.** EPA's Excess Food Opportunities Map displays the locations of more than 500,000 industrial, commercial, and institutional food generators that may potentially produce excess food and more than 4,000 potential recipients of that excess food. The map also provides information at the specific establishment-level, including estimates of excess food generation that may help users identify alternatives to sending excess food to landfills. The map helps users identify potential infrastructure gaps for managing excess food, inform FLW management decisions at the local level, and identify potential sources of food for rescue and reuse, among other purposes. An EPA official told us that the communication plan for the launch of the Excess Food Opportunities Map included a webinar announcing the map in July 2018 and providing presentations

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<sup>50</sup>According to FDA officials, this resulted in the formation of the Conference for Food Protection's Food Donation and Recovery Committee, which is charged with (1) developing user-friendly guidance for the safe handling and distribution of foods being donated by retail and foodservice establishments and (2) making recommendations for modifications to the FDA Food Code to better address food donation and recovery practices. FDA has representatives on the committee and will review the committee's recommendations for FDA Food Code modifications, once they are completed.



about the map at various conferences, including during the National Academies Reducing Food Loss and Waste Workshop in October 2018. The official also stated that emails about the map were sent to over 13,000 people and approximately 700 people attended the webinar EPA hosted in July 2018.

- **Recycling infrastructure.** EPA's Sustainable Materials Management program's strategic plan describes EPA's role in providing states, businesses, and other stakeholders with, among other things, tools, guidelines, and technical support to more effectively manage waste, including by helping increase recycling infrastructure. In May 2018, EPA cohosted a recycling infrastructure workshop to identify solutions for creating infrastructure for anaerobic digestion and composting. In addition, EPA officials told us that the agency is in the process of updating its recycling guide for state and local governments and they anticipate completing it by the end of 2020.<sup>51</sup>

USDA also has taken some actions to increase infrastructure and capacity to reduce FLW in the United States. For example:

- **Food programs.** USDA officials told us that USDA food programs, such as The Emergency Food Assistance Program, support efforts to feed people and to provide access to affordable and nutritious food. For example, food donation organizations that are recipients of program funds may use these funds to pay the direct expenses associated with the distribution of USDA foods, such as fruits, vegetables, and beans.
- **New FLW-reduction technologies.** USDA's Agricultural Research Service has various research programs, including one to enhance the quality and utilization of agricultural products. Potential benefits listed as part of this research program are minimizing food product losses and reducing FLW through the development of farm production technologies, such as the development of an apple-sorting system that will help reduce apple harvest losses. According to USDA officials, most of the innovations of this research program involve creating value-added products from "ugly produce" or from food processing byproducts, such as orange peel or mushroom-stalk waste, or creating new technologies to prolong the shelf life of food products.

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<sup>51</sup>Environmental Protection Agency, *Measuring Recycling: A Guide for State and Local Governments*, EPA530-R-97-011 (Washington, D.C.: September 1997).

- **Meat and poultry donation rules.** USDA’s Food Safety and Inspection Service issued a directive that outlines procedures for donating certain meat and poultry products to nonprofit organizations.<sup>52</sup> The Food Safety and Inspection Service has also begun, under certain circumstances, to recognize food banks as “retail-type” establishments, which allows food banks to break down bulk shipments of federally inspected meat or poultry products, wrap or rewrap those products, and label the products for distribution to consumers. In one case, this recognition enabled a nonprofit organization engaged in food donations to gain 2.6 million pounds of food donations from manufacturers in 2016, according to USDA documents.
- **Grant funding.** USDA’s Rural Utilities Service has provided some funding to support FLW reduction infrastructure in rural communities. For example, USDA awarded a 2016 USDA Rural Utilities Service Solid Waste Management grant to the University of Iowa’s Waste Reduction Center, which has worked toward addressing the issue of FLW disposal. More recently, in 2018, USDA awarded a solid-waste management grant to the Center for EcoTechnology, a nonprofit that provides technical assistance to implement FLW diversion programs.
- **Low-interest loans.** USDA’s Farm Storage Facility Loan Program provides low-interest loans for producers to store, handle, and transport the food they produce. The loans are designed to assist a diverse range of farming operations, including small and midsized businesses and operations supplying local food and farmers markets. The program helps keep food from being damaged by pests or inclement weather, among other things, so that more food can reach store shelves.
- **Funding for renewable energy systems.** USDA’s Rural Energy for America Program provides grants and loan guarantees to farmers, ranchers, and eligible small businesses to install renewable energy and energy-efficiency systems. For example, according to a Rural Energy for America Program Fact Sheet, funds may be used for the

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<sup>52</sup>U.S. Department of Agriculture Food Safety and Inspection Service, *Verifying Donation of Misbranded and Economically Adulterated Meat and Poultry Products to Non-Profit Organizations*, Directive 7020.1 (Jan. 26, 2016). This directive addresses the donation of misbranded or economically adulterated, but otherwise wholesome, meat and poultry products. Examples of a wholesome misbranded product that may be donated include a product that is labeled with the incorrect net weight. An economically adulterated product is a product from which any valuable constituent in whole or in part has been omitted or removed, or in which a less valuable substance has been substituted.

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purchase, installation, and construction of renewable energy systems, such as anaerobic digesters. In a 2016 USDA Rural Development report, USDA provided examples of anaerobic digesters that use FLW to produce a biogas that is converted into energy.

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## EPA, USDA, and FDA Have Done Some Initial Planning toward Achieving the National FLW Reduction Goal

EPA and USDA have each taken some actions to plan and organize their efforts toward achieving the national FLW reduction goal, such as issuing strategic plans and establishing working groups. Additionally, EPA, USDA, and FDA signed a joint agency formal agreement in October 2018 aimed at increasing collaboration and coordination among the agencies on FLW reduction efforts. EPA, USDA, and FDA only recently initiated their interagency collaboration on FLW reduction efforts toward achieving the national FLW reduction goal, but have not yet taken certain steps that align with key practices for interagency collaboration.

EPA has taken actions to guide its own efforts toward achieving the national FLW reduction goal. For example, in 2015, EPA issued a strategic plan that included a strategic priority area of sustainable food management.<sup>53</sup> Subsequently, EPA developed an internal planning document (*U.S. EPA Sustainable Management of Food Strategy, Fiscal Year 2018-2022*). This planning document established action areas, goals, and activities for reducing FLW to achieve the national FLW reduction goal. For example, the plan identified five action areas, including addressing data and measurement issues, collaboration and partnerships, technical assistance, infrastructure and capacity, and communication and outreach. According to EPA officials, the agency intends to use the plan to track its progress and measure results towards the national FLW reduction goal.

USDA has also taken actions to guide its own efforts toward achieving the national FLW reduction goal. For example, according to USDA officials, the department established a FLW working group in 2015 that currently meets on a monthly basis. According to officials from the Office of the

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<sup>53</sup>EPA, *U.S. EPA Sustainable Materials Management Program Strategic Plan, Fiscal Year 2017-2022*.

Chief Economist and ERS, the department also designated an individual within the Office of the Chief Economist to guide USDA's FLW efforts. In addition, in March 2016, the National Institute for Food and Agriculture's Pilot Science Outcome Committee on Environmental Sustainability identified FLW as a top science priority area to address environmental sustainability.<sup>54</sup> According to the committee, FLW is an integral component of environmental sustainability, and mitigating FLW has the potential to create economic, environmental, and social benefits while contributing to food security, resource conservation, and the mitigation of climate change.

Furthermore, EPA and USDA have contributed to the work of the Commission for Environmental Cooperation, an intergovernmental organization established by the governments of Canada, Mexico, and the United States to facilitate effective cooperation on the conservation, protection, and enhancement of the environment in their territories. The organization has an initiative to identify challenges, opportunities, and solutions related to increasing organic waste diversion and processing capacity in North America. This organization issued a report in 2017 about, among other things, the management of organic waste and best practices for reducing FLW and diverting other organic waste materials away from landfills.<sup>55</sup> EPA is on the steering committee for this effort. According to an EPA announcement in March 2019, the commission issued a practical guide<sup>56</sup> and technical report on FLW measurement.<sup>57</sup>

Moreover, in October 2018, the Secretary of Agriculture hosted a public meeting to promote FLW reduction. During this meeting, EPA, USDA, and FDA signed a formal interagency agreement referred to by the agencies

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<sup>54</sup>U.S. Department of Agriculture National Institute for Food and Agriculture, *NIFA Pilot Science Outcome Committee on Environmental Sustainability: Science Priority Recommendations & Implementation Process Final Report* (March 2016).

<sup>55</sup>Commission for Environmental Cooperation, *Characterization and Management of Organic Waste in North America—Foundational Report* (Montreal, Canada: 2017).

<sup>56</sup>Commission for Environmental Cooperation, *Why and How to Measure Food Loss and Waste: A Practical Guide* (Montreal, Canada: 2019), accessed June 10, 2019, <http://www3.cec.org/islandora/en/item/11814-why-and-how-measure-food-loss-and-waste-practical-guide-en.pdf>.

<sup>57</sup>Commission for Environmental Cooperation, *Technical Report: Quantifying Food Loss and Waste and Its Impacts* (Montreal, Canada: 2019), accessed June 10, 2019, <http://www3.cec.org/islandora/en/item/11813-technical-report-quantifying-food-loss-and-waste-and-its-impacts-en.pdf>.

as the *Winning on Reducing Food Waste* initiative. Under this 2-year agreement, the agencies committed to developing an interagency strategic plan to increase collaboration and coordination among the agencies on their FLW reduction efforts. According to the agreement, this additional collaboration is intended to strategically align each agency's efforts to better educate Americans on the impacts of reducing FLW. The agencies also agreed to, where appropriate, educate actors throughout the supply chain on the best practices to reduce FLW in the growing, manufacturing, transporting, selling, and disposing of food and the handling, preparation, and storage of food, as well as creating new uses for excess food. The formal agreement mentions public-private partnerships and, according to EPA officials, the agencies intend to use the views of stakeholders in the public, private, and nonprofit sectors to inform their strategic plan. According to EPA officials, the agencies intend to discuss common goals and to identify additional initiatives as appropriate to achieve the national FLW reduction goal. In announcing this initiative, the Secretary of Agriculture affirmed the importance of reducing FLW by saying that "an unacceptable percentage of our food supply is lost or wasted" and that "as the world's population continues to grow and the food systems continue to evolve, now is the time for action to educate consumers and businesses alike on the need for food waste reduction." In addition, the FDA Commissioner stated that "by taking steps to address obstacles that food donation and recovery programs may face in giving unsold foods a second opportunity and helping food producers find ways to recondition their products so that they can be safely sold or donated, our aim is to both reduce food waste and nourish Americans in need."

In April 2019, the agencies held a public event to announce their *Winning on Reducing Food Waste Federal Interagency Strategy*.<sup>58</sup> This strategic plan identified six prioritized action areas for activities to reduce FLW. For example, the agencies plan to, among other things, increase consumer education and outreach efforts; increase coordination and guidance on FLW measurement; and clarify and communicate information on food safety, food date labels, and food donations. In addition, the agencies signed a formal agreement with ReFED to, among other things, better

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<sup>58</sup>U.S. Environmental Protection Agency, U.S. Department of Agriculture, and U.S. Food and Drug Administration, *Winning on Reducing Food Waste Federal Interagency Strategy* (April 2019), accessed April 12, 2019, <https://www.epa.gov/sustainable-management-food/winning-reducing-food-waste-federal-interagency-strategy>.

evaluate and improve upon strategies to reduce FLW.<sup>59</sup> For example, according to the 2019 agreement, the agencies and ReFED intend to leverage existing partnerships to advance data-collection and measurement activities related to FLW. Finally, EPA announced that it had selected three recipients to receive EPA funding to support infrastructure projects to help reduce FLW and divert FLW from landfills.

In our prior work, we have found that key practices to enhance and sustain interagency collaboration include agreeing on roles and responsibilities and developing mechanisms to monitor, evaluate, and report on results.<sup>60</sup> In addition, we have found that key practices for agency collaboration call for clearly defining short- and long-term outcomes.<sup>61</sup> Furthermore, such interagency efforts benefit from identifying how leadership commitment will be sustained.<sup>62</sup> Lastly, we identified a key practice that calls for ensuring that the relevant stakeholders have been included in the collaborative effort. This collaboration can include other

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<sup>59</sup>U.S. Environmental Protection Agency, U.S. Department of Agriculture, and U.S. Food and Drug Administration, *Formal Agreement Among the United States Environmental Protection Agency and the United States Food and Drug Administration and the United States Department of Agriculture Relative to a Federal–Nongovernmental Organization Formal Agreement with Rethink Food Waste Through Economics and Data (ReFED) Inc. in Order to Better Evaluate and Improve Upon Strategies to Reduce Food Loss and Waste* (Washington, D.C.: April 2019), accessed April 12, 2019, [https://www.epa.gov/sites/production/files/2019-04/documents/refed-epa-usda-fda\\_formal\\_agreement.pdf](https://www.epa.gov/sites/production/files/2019-04/documents/refed-epa-usda-fda_formal_agreement.pdf).

<sup>60</sup>GAO-06-15. In this report, we identified eight leading practices: (1) define and articulate a common outcome; (2) establish mutually reinforcing or joint strategies; (3) identify and address needs by leveraging resources; (4) agree on roles and responsibilities; (5) establish compatible policies, procedures, and other means to operate across agency boundaries; (6) develop mechanisms to monitor, evaluate, and report on results; (7) reinforce agency accountability for collaborative efforts through agency plans and reports; and (8) reinforce individual accountability for collaborative efforts through performance management systems.

<sup>61</sup>GAO-12-1022. In this report, we identified key considerations, such as clearly defining short-term and long-term outcomes; implementing mechanisms to track and monitor progress; identifying the missions and organizational cultures of the participating agencies; agreeing on common terminology and definitions; determining how leadership will be sustained over the long term; if leadership is shared, identifying and agreeing upon roles and responsibilities; clarifying participating agencies roles and responsibilities; ensuring all relevant participants have been included; ensuring that participants have the ability to commit resources for their agency; identifying how the collaborative mechanism will be funded and staffed; if appropriate, documenting how participating agencies will be collaborating; and developing ways to continually update and monitor these agreements.

<sup>62</sup>GAO-12-1022 and GAO-14-220.

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federal agencies, state and local entities, and private and nonprofit organizations.<sup>63</sup>

According to the strategic plan, the agencies built on information from several sources, including prior GAO work on implementing interagency collaborative mechanisms, to develop the *Winning on Reducing Food Waste Federal Interagency Strategy*. However, this strategic plan does not align with certain key practices for interagency collaboration. For example, the first priority area identified in the strategic plan is to enhance interagency collaboration, and the strategic plan states that an interagency, collaborative mechanism will be established to reduce programmatic redundancies and leverage complementary activities. However, the strategic plan does not identify how this mechanism will be used to monitor, evaluate, or report on results, establish a time frame for developing this collaborative mechanism, or describe how the agencies will engage relevant stakeholders, such as other federal, state, and local agencies, nonprofit organizations, academic institutions, food industry entities, international organizations, and tribal organizations. In addition, several of the strategic plan's priority areas address specific aspects of reducing FLW, such as encouraging FLW reduction by federal agencies in their respective facilities. However, the strategic plan does not identify the roles and responsibilities of the respective agencies for taking action in these areas and it does not clearly define what specific short- and long-term outcomes the agencies intend to achieve. Furthermore, the agencies have not identified how they intend to sustain leadership commitment to this goal. For example, the *Winning on Reducing Food Waste* formal interagency collaborative agreement is a 2-year agreement among the agencies, but the national FLW reduction goal calls for reducing FLW by half by 2030, which falls well beyond this 2-year time frame. According to a USDA official, the agencies do not have plans for how they will continue their interagency collaboration beyond the life of the current agreement. This official noted that the agencies do not intend to update the strategic plan for the duration of the 2-year agreement and that the agencies will release more information to the public about specific actions and timelines as it becomes available. By incorporating leading practices for interagency collaboration as they implement their interagency strategic plan, EPA, USDA, and FDA would have better assurance that they are effectively collaborating toward achieving the national FLW reduction goal.

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<sup>63</sup>[GAO-12-1022](#).

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## Conclusions

Achieving the national FLW reduction goal could provide significant economic, environmental, and social benefits to the United States, such as helping to lower consumer expenses, reducing harmful greenhouse gas emissions, and providing additional meals to feed food-insecure people through increased food donations. This is an important issue that requires action across the food supply chain and collaboration among federal agencies and nonfederal stakeholders, such as states and businesses. EPA and USDA have taken steps to develop programs and policies that aim to reduce FLW and to collaborate on their various initiatives. In addition, EPA, USDA, and FDA have taken some actions to plan and organize their efforts toward achieving the national goal of reducing FLW by half by 2030, including announcing an interagency strategic plan to reduce FLW. However, this strategic plan does not align with key practices in interagency collaboration that we have identified, such as agreeing on roles and responsibilities; developing mechanisms to monitor, evaluate, and report on results; clearly defining short- and long-term outcomes; identifying how leadership commitment will be sustained; and ensuring that the relevant stakeholders have been included in the collaborative effort. By incorporating such leading practices for interagency collaboration as they implement their interagency strategic plan, EPA, USDA, and FDA would have better assurance that they are effectively collaborating toward achieving the national FLW reduction goal.

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## Recommendations for Executive Action

We are making three recommendations to the agencies in our review. Specifically:

- The Administrator of EPA should work with the Commissioner of FDA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan, to include (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short- and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. (Recommendation 1)



- The Commissioner of FDA should work with the Administrator of EPA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan, to include (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short- and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. (Recommendation 2)
- The Secretary of Agriculture should work with Administrator of EPA and Commissioner of FDA to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan, to include (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short- and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. (Recommendation 3)

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## Agency Comments

We provided a draft of this report to EPA, USDA, and the Department of Health and Human Services for review and comment. We also provided CEQ and OMB a draft of this report for review. In its comments, reproduced in appendix I, EPA agreed with our recommendation to the agency and described current and future actions to implement the recommendation. Similarly, in its comments, reproduced in appendix II, USDA agreed with our recommendation to it and described current and future actions to implement the recommendation. In addition, in its comments, reproduced in appendix III, the Department of Health and Human Services concurred with our recommendation to it and described current and future actions to implement the recommendation. USDA and CEQ provided technical comments, which we incorporated as appropriate.

In response to our recommendations, EPA, USDA, and the Department of Health and Human Services said that they will work with each other to incorporate leading collaboration practices as they implement the interagency FLW reduction strategic plan. Both EPA and USDA also stated that they intend to complete implementation of their respective recommendations by October 2020, to align with the duration of the 2-year formal agreement between EPA, USDA, and FDA. The Department of Health and Human Services stated that FDA issued a letter to the food

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industry supporting the industry's efforts to standardize voluntary quality date labeling.

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We are sending copies of this report to the appropriate congressional committees, the Administrator of EPA, the Secretary of Agriculture, the Secretary of Health and Human Services, the Director of OMB, the Chair of CEQ, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions concerning this report, please contact me at (202) 512-3841 or [morriss@gao.gov](mailto:morriss@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.



Steve Morris  
Director,  
Natural Resources and Environment Team

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# Appendix I: Comments from the U.S. Environmental Protection Agency

**Appendix I: Comments from the U.S.  
Environmental Protection Agency**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
WASHINGTON, D.C. 20460

**JUN 11 2019**

Mr. Alfredo Gomez  
Director  
Natural Resources and the Environment  
U.S. Government and Accountability Office  
Washington, DC 20548

OFFICE OF  
SOLID WASTE AND  
EMERGENCY RESPONSE  
  
NOW THE  
OFFICE OF LAND AND  
EMERGENCY MANAGEMENT

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's (GAO) draft report, *Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal (GAO-19-391)*.

This letter provides the U.S. Environmental Protection Agency's (EPA) response to GAO's draft report findings, conclusions, and recommendations. The draft report examines efforts by federal agencies to reduce food loss and waste (FLW). It (1) describes nonfederal stakeholder views on key challenges to reducing FLW in the United States, (2) describes actions EPA and USDA have taken to address key challenges to reducing FLW in the United States, and (3) examines federal planning efforts toward achieving the national FLW reduction goal. GAO reviewed federal reports on FLW; analyzed agency documents; interviewed officials from EPA, the U.S. Department of Health and Human Services' Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA) and states and representatives of nonfederal stakeholders, such as academic institutions, industry, international organizations, nonprofits, and a tribal organization, based on their demonstrated expertise on FLW; and attended conferences on FLW.

The EPA appreciates the GAO's work on this subject area and the collegial working relationship and dialogue with our staff. EPA understands the need for interagency coordination to achieve the national goal to reduce food loss and waste by half by the year 2030 and is working closely and collaborating with USDA and FDA. The EPA agrees with the GAO's findings, conclusions, and recommendations.

Recommendation 1 is directed at EPA. Below are EPA's comments on this GAO recommendation.

GAO Recommendation 1

The Administrator of EPA should work with the Commissioner of FDA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan to include: (1) agreeing on roles and responsibilities; (2)

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**Appendix I: Comments from the U.S.  
Environmental Protection Agency**

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developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort.

EPA Response

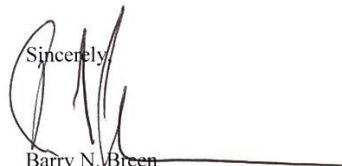
The EPA agrees with the recommendation to incorporate the following practices as we implement the interagency FLW reduction strategic plan: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. The EPA intends to complete implementation of all recommendations by October 2020, to align with the duration of the two-year formal agreement with USDA and FDA.

As the GAO's draft report states, "in April 2019, the agencies announced an interagency strategic plan with prioritized action areas to reduce FLW." That strategic plan lays out six priority areas on which the agencies will focus:

- Priority Area 1: Enhance Interagency Coordination
- Priority Area 2: Increase Consumer Education and Outreach Efforts
- Priority Area 3: Improve Coordination and Guidance on Food Loss and Waste Measurement
- Priority Area 4: Clarify and Communicate Information on Food Safety, Food Date Labels, and Food Donations
- Priority Area 5: Collaborate with Private Industry to Reduce Food Loss and Waste Across the Supply Chain
- Priority Area 6: Encourage Food Waste Reduction by Federal Agencies in their Respective Facilities

The EPA will continue to coordinate and collaborate with USDA and FDA. Together, we will build upon the interagency FLW reduction strategic plan's six priority areas through working groups with representatives from each of the agencies. We will share our efforts, results, and progress in each of the priority areas on our webpage: <https://www.epa.gov/sustainable-management-food/winning-reducing-food-waste-federal-interagency-strategy>.

The EPA regularly invites input from stakeholders and community representatives to ensure collaborative sustainable management of food efforts. The EPA will continue to leverage existing, and create new networks and partnerships, in an effort to expand and continue the dialogue on food loss and waste.

Sincerely,  
  
Barry N. Breen  
Acting Assistant Administrator

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# Appendix II: Comments from the U.S. Department of Agriculture

**Appendix II: Comments from the U.S.  
Department of Agriculture**



United States Department of Agriculture

Office of the Chief Economist  
1400 Independence Avenue, SW  
Washington, D.C. 20250-3810

JUN 6 2019

Mr. Steve Morris  
Director  
Natural Resources and the Environment  
U.S. Government and Accountability Office  
Washington, D.C. 20548

Dear Mr. Morris:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's (GAO) draft report, *Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal (GAO-19-391)*.

This letter provides the U.S. Department of Agriculture's (USDA) response to GAO's draft report findings, conclusions, and recommendations.

The USDA agrees with GAO's recommendation to the Department. Specifically, in response to recommendation number 3, which is the recommendation to USDA, USDA will work with the U.S. Environmental Protection Agency (EPA) and the U.S. Food and Drug Administration (FDA) to incorporate the following practices as we implement the interagency FLW reduction strategic plan: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. USDA intends to complete implementation of all recommendations by October 2020, to align with the duration of the 2-year formal agreement with EPA and FDA.

USDA has already begun work with EPA and FDA to implement GAO's recommendations through the formation of working groups with representatives from each of the agencies as well as through formal collaboration with broader groups of stakeholders such as ReFed and the Food Waste Reduction Alliance (composed of the Grocery Manufacturers Association, the Food Marketing Institute and the National Restaurant Association). We will periodically update and share information about our efforts and progress on our webpage: <https://www.usda.gov/foodlossandwaste>.

The USDA also agrees with GAO's general findings and conclusions in the draft report. We suggest, however, a number of clarifying edits, which we have forwarded to the GAO point of contact.

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert Johansson".

Robert Johansson  
Chief Economist

An Equal Opportunity Employer



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# Appendix III: Comments from the U.S. Department of Health and Human Services

Appendix III: Comments from the U.S.  
Department of Health and Human Services



DEPARTMENT OF HEALTH & HUMAN SERVICES

OFFICE OF THE SECRETARY

Assistant Secretary for Legislation  
Washington, DC 20201

JUN 13 2019

John Dicken  
Director, Healthcare  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Mr. Dicken:

Attached are *comments* on the U.S. Government Accountability Office's (GAO) report entitled, "*Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal*" (GAO-19-391).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

A handwritten signature in blue ink, appearing to read "S. Arbes".

Sarah Arbes  
Acting Assistant Secretary for Legislation

Attachment

**GENERAL COMMENTS FROM THE DEPARTMENT OF HEALTH & HUMAN SERVICES ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S DRAFT REPORT ENTITLED - FOOD LOSS AND WASTE: BUILDING ON EXISTING FEDERAL EFFORTS COULD HELP TO ACHIEVE NATIONAL REDUCTION GOAL (GAO-19-391)**

The U.S. Department of Health and Human Services (HHS) appreciates the opportunity from the Government Accountability Office (GAO) to review and comment on the draft report. The Food and Drug Administration (FDA) is committed to working with the Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) to educate consumers, engage key stakeholders, and develop and evaluate solutions to reduce food loss and waste, including through our collaboration with EPA and USDA on the *Winning on Reducing Food Waste Initiative*.

FDA continues to work with federal partners and other stakeholders to educate Americans on how to reduce food waste and how to do so safely without risking illness. Food waste by consumers may result from a misunderstanding of what the phrases on product date labels mean, along with uncertainty about storage of perishable foods. To that end, in May, issued a letter to the food industry supporting the industry's efforts to standardize voluntary quality date labeling.

Reducing food waste is a shared responsibility and, coordination between agencies at all levels of government will remain critical to meet the national reduction goal of reducing food loss and waste by 50 percent by 2030.

**Recommendation 2**

The Commissioner of FDA should work with the Administrator of EPA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan to include: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort.

**HHS Response**

HHS concurs with GAO's recommendation.

In April 2019, FDA, EPA, and USDA announced an interagency strategy that prioritized six action areas to reduce food loss and waste.<sup>1</sup> FDA, along with EPA and USDA, are continuing to work together to develop mechanisms for measuring progress and for defining desired short- and long-term outcomes for each of the interagency strategy's six priority areas. FDA will continue to seek input from our stakeholders, including agency partners at all levels of government, the food and feed industries, academia and consumers, and leverage partnerships as we seek to achieve the food loss and waste reduction goals. As we make progress toward identifying and implementing these efforts, FDA will share relevant information and results about each of the priority areas on our webpage: <https://www.fda.gov/food/consumers/food-waste-and-loss>.

<sup>1</sup>See *Winning on Reducing Food Waste Federal Interagency Strategy*: <https://www.epa.gov/sustainable-management-food/winning-reducing-food-waste-federal-interagency-strategy>

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Steve D. Morris at (202) 512-3841 or [morriss@gao.gov](mailto:morriss@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Anne K. Johnson (Assistant Director), Joseph Capuano (Analyst in Charge), David Bennett, Carol Bray, Tara Congdon, Juan Garay, Serena Lo, Greg Marchand, Jordan Mettica, Oliver Richard, Dan Royer, Marie Suding, Kiki Theodoropoulos, and Sarah Veale made key contributions to this report.

# Appendix V: Accessible Data

## Data Table

**Accessible Data for Figure 3: EPA Total Municipal Solid Waste Landfilled by Material, 2015**

<b>Municipal solid waste material</b>	<b>Percent landfilled</b>	<b>Weight landfilled (millions of tons)</b>
Food	22.0%	30.25
Plastics	18.9%	26.01
Paper & paperboard	13.3%	18.27
Rubber, leather, and textiles	10.9%	14.75
Metals	9.5%	12.89
Wood	8.0%	11.06
Yard trimmings	7.8%	10.8
Glass	5.1%	6.97
Other	4.5%	6.7
n/a	100.0%	137.7

## Agency Comment Letters

Accessible Text for Appendix I Comments from the U.S. Environmental Protection Agency

Page 1

JUN 11 2019

Mr. Alfredo Gomez

Director

Natural Resources and the Environment

U.S. Government and Accountability Office

Washington, DC 20548

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's (GAO) draft report, Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal (GAO-19-391).

This letter provides the U.S. Environmental Protection Agency's (EPA) response to GAO's draft report findings, conclusions, and recommendations. The draft report examines efforts by federal agencies to reduce food loss and waste (FLW). It (1) describes nonfederal stakeholder views on key challenges to reducing FLW in the United States, (2) describes actions EPA and USDA have taken to address key challenges to reducing FLW in the United States, and (3) examines federal planning efforts toward achieving the national FLW reduction goal. GAO reviewed federal reports on FLW; analyzed agency documents; interviewed officials from EPA, the U.S. Department of Health and Human Services, food and Drug Administration (FDA), U.S. Department of Agriculture (USDA) and states and representatives of nonfederal stakeholders, such as academic institutions, industry, international organizations, nonprofits, and a tribal organization, based on their demonstrated expertise on FLW; and attended conferences on FLW.

The EPA appreciates the GAO's work on this subject area and the collegial working relationship and dialogue with our staff. EPA understands the need for interagency coordination to achieve the national goal to reduce food loss and waste by half by the year 2030 and is working closely and collaborating with USDA and FDA. The EPA agrees with the GAO's findings, conclusions, and recommendations.

Recommendation 1 is directed at EPA. Below are EPJ's comments on this GAO recommendation.

#### GAO Recommendation 1

The Administrator or EPA should work with the Commissioner of FDA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan to include: (1) agreeing on roles and responsibilities; (2)

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Page 2

developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort.

EPA Response

The EPA agrees with the recommendation to incorporate the following practices as we implement the interagency FLW reduction strategic plan: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. The EPA intends to complete implementation of all recommendations by October 2020, to align with the duration of the two-year formal agreement with USDA and FDA.

As the GAO's draft report states, "in April 2019, the agencies announced an interagency strategic plan with prioritized action areas to reduce FLW." That strategic plan lays out six priority areas on which the agencies will focus:

- Priority Area 1 : Enhance Interagency Coordination
- Priority Area 2: Increase Consumer Education and Outreach Efforts
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- Priority Area 4: Clarify and Communicate Information on Food Safety, Food Date Labels, and Food Donations
- Priority Area 5: Collaborate with Private Industry to Reduce Food Loss and Waste Across the Supply Chain
- Priority Area 6: Encourage Food Waste Reduction by Federal Agencies in their Respective Facilities

The EPA will continue to coordinate and collaborate with USDA and FDA. Together, we will build upon the interagency FLW reduction strategic

plan's six priority areas through working groups with representatives from each of the agencies. We will share our efforts, results, and progress in each of the priority areas on our webpage:  
<https://www.epa.gov/sustainable-management-food/winning-reducing-food-waste-federal-interagency-strategy>.

The EPA regularly invites input from stakeholders and community representatives to ensure collaborative sustainable management of food efforts. The EPA will continue to leverage existing, and create new networks and partnerships, in an effort to expand and continue the dialogue on food loss and waste.

Sincerely,

Barry N. Breen

Acting Assistant Administrator

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## Accessible Text for Appendix II Comments from the U.S. Department of Agriculture

JUN 6 2019

Mr. Steve Morris

Director

Natural Resources and the Environment

U.S. Government and Accountability Office

Washington, D.C. 20548

Dear Mr. Morris:

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's (GAO) draft report, Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal (GAO-19-391).



This letter provides the U.S. Department of Agriculture's (USDA) response to GAO's draft report findings, conclusions, and recommendations.

The USDA agrees with GAO's recommendation to the Department. Specifically, in response to recommendation number 3, which is the recommendation to USDA, USDA will work with the U.S. Environmental Protection Agency (EPA) and the U.S. Food and Drug Administration (FDA) to incorporate the following practices as we implement the interagency FLW reduction strategic plan: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort. USDA intends to complete implementation of all recommendations by October 2020, to align with the duration of the 2-year formal agreement with EPA and FDA.

USDA has already begun work with EPA and FDA to implement GAO's recommendations through the formation of working groups with representatives from each of the agencies as well as through formal collaboration with broader groups of stakeholders such as ReFed and the Food Waste Reduction Alliance (composed of the Grocery Manufacturers Association, the Food Marketing Institute and the National Restaurant Association). We will periodically update and share information about our efforts and progress on our webpage:  
<https://www.usda.gov/foodlossandwaste>.

The USDA also agrees with GAO's general findings and conclusions in the draft report. We suggest, however, a number of clarifying edits, which we have forwarded to the GAO point of contact.

Sincerely,

Robert Johansson

Chief Economist

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Accessible Text for Appendix III Comments from the U.S.  
Department of Health and Human Services

Page 1

JUN 13 2019

John Dicken

Director, Healthcare

U.S. Government Accountability Office

441 G Street NW

Washington, DC 20548

Dear Mr. Dicken:

Attached are comments on the U.S. Government Accountability Office's (GAO) report entitled, " Food Loss and Waste: Building on Existing Federal Efforts Could Help to Achieve National Reduction Goal" (GAO-19-391).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

Sarah Arbes

Acting Assistant Secretary for Legislation

Attachment

Page 2

GENERAL COMMENTS FROM THE DEPARTMENT OF HEALTH &  
HUMAN SERVICES ON THE GOVERNMENT ACCOUNTABILITY  
OFFICE'S DRAFT REPORT ENTITLED - FOOD LOSS AND WASTE:  
BUILDING ON EXISTING FEDERAL EFFORTS COULD HELP TO  
ACHIEVE NATIONAL REDUCTION GOAL (GAO-19-391)

The U.S. Department of Health and Human Services (HHS) appreciates the opportunity from the Government Accountability Office (GAO) to review and comment on the draft report. The Food and Drug Administration (FDA) is committed to working with the Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) to educate consumers, engage key stakeholders, and develop and evaluate solutions to reduce food loss and waste, including through our collaboration with EPA and USDA on the Winning on Reducing Food Waste Initiative.

FDA continues to work with federal partners and other stakeholders to educate Americans on how to reduce food waste and how to do so safely without risking illness. Food waste by consumers may result from a misunderstanding of what the phrases on product date labels mean, along with uncertainty about storage of perishable foods. To that end, in May, issued a letter to the food industry supporting the industry's efforts to standardize voluntary quality date labeling.

Reducing food waste is a shared responsibility and, coordination between agencies at all levels of government will remain critical to meet the national reduction goal of reducing food loss and waste by 50 percent by 2030.

#### Recommendation 2

The Commissioner of FDA should work with the Administrator of EPA and Secretary of Agriculture to incorporate leading collaboration practices as they implement their interagency FLW reduction strategic plan to include: (1) agreeing on roles and responsibilities; (2) developing mechanisms to monitor, evaluate, and report on results; (3) clearly defining short and long-term outcomes; (4) identifying how leadership commitment will be sustained; and (5) ensuring that the relevant stakeholders have been included in the collaborative effort.

#### HHS Response

HHS concurs with GAO's recommendation.

In April 2019, FDA, EPA, and USDA announced an interagency strategy that prioritized six action areas to reduce food loss and waste. 1 FDA, along with EPA and USDA, are continuing to work together to develop mechanisms for measuring progress and for defining desired short- and long-term outcomes for each of the interagency strategy's six priority

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areas. FDA will continue to seek input from our stakeholders, including agency partners at all levels of government, the food and feed industries, academia and consumers, and leverage partnerships as we seek to achieve the food loss and waste reduction goals. As we make progress toward identifying and implementing these efforts, FDA will share relevant information and results about each of the priority areas on our webpage: <https://www.fda.gov/food/consumers/food-waste-and-loss>.

<sup>1</sup>See Winning on Reducing Food Waste Federal Interagency Strategy: <https://www.epa.gov/sustainable-management-food/winning-reducing-food-waste-federal-interagency-strategy>

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