**Excerpts from “WASTED: HOW AMERICA IS LOSING UP TO 40 PERCENT OF ITS FOOD FROM FARM TO FORK TO LANDFILL” by Dana Gunders with Jonathan Bloom and significant contributions from JoAnne Berkenkamp, Darby Hoover, Andrea Spacht, and Marie Mourad (August 2017)**

**FROM THE GROUND UP: ECOLOGICAL IMPACTS OF WASTED FOOD**

1 One of the most shocking aspects of wasted food is the enormous loss of “embedded resources”—that is, those that were required to get that food from the seed to the table. The vast majority of these resources are used in the food’s production, by far the most resource-intensive stage of the supply chain. Moreover, a dramatic amount of climate pollution is created in producing all of that uneaten food.

2 Streamlining our food system today can help avoid further straining our resources to feed ourselves tomorrow. The population in 2050 is predicted to demand 1.5 to 2 times as much food as we needed in 2005. The most obvious first step toward meeting this demand is to eat the food we already grow (but don’t currently eat). In fact, it’s estimated that halving food losses would amount to enough food to feed 1 billion additional people. That’s more than the number of undernourished people across the world in 2015.

3 The EPA’s Food Recovery Hierarchy rests on the logic that preventing surplus food in the first place will ultimately reduce demand for product that is currently being wasted, thus conserving more resources than donating or recycling food. There is some uncertainty, however, as to how directly preventing food waste will impact demand, given our global economy. For instance, if U.S. consumers waste fewer strawberries, would farmers grow less (using fewer resources) or export more? The United Kingdom did demonstrate that wasting less food correlated with lower per capita demand, but more research is needed. It is clear, however, that recycling food does less to address the inefficiency of our food system, compared with preventing the wasting of food, which has the greatest potential for cost savings and environmental benefits.

4 From a resource perspective, not all wasted food is equal. For example, meat production requires more water than other products, and this is true for other ecological impacts as well, due to the relatively high amounts of feed needed to produce meat and excessive greenhouse gas footprint of cattle. Of all the crops grown around the world, 37 percent (primarily corn and soy) is used to feed livestock—yet that livestock produces only 11 percent of the global food supply. While the majority of grains grown for livestock feed are not fit for human consumption, the land and resources used to produce them could be used to grow crops that directly feed people. Some analysts consider this in itself a form of food loss.

5 Food waste accounts for the equivalent of 21 to 33 percent of U.S. agricultural water use. In fact, throwing out just one hamburger wastes as much water as a 90-minute shower! Producing an egg, on the other hand, requires about as much water as an 11-minute shower.

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6 An area equivalent to between 18 and 28 percent of our cropland is used to grow food that is ultimately not eaten. Even the conservative estimate is about the size of New Mexico. As food demand increases with population growth, we will need to use more land to grow food, prompting deforestation and other land use changes. These changes would increase the emissions footprint of food waste by 25 to 40 percent. Beyond that, uncultivated lands play a critical role in filtering air and water, providing wildlife habitat, and preserving biodiversity. Streamlining our use of food so that we don’t need to grow more than we actually use is a key strategy for keeping wildlands wild while still meeting our needs.

7 Food waste consumes the equivalent of 19 to 27 percent of fertilizer used in the United States.57 These fertilizers can lead to water pollution when too much is applied and the excess runs off into waterways, and to greenhouse gas emissions from the way the fertilizer interacts with microbes in the soil. Synthetic fertilizer production also consumes enormous amounts of energy. Using compost to fertilize instead can offset the need for synthetic fertilizers while recycling the nutrients in food waste. It also delivers nutrients in a different form, which reduces the likelihood of pollution problems.

8 Food waste in the United States is responsible for at least 2.6 percent of all U.S. greenhouse gas emissions. That’s equivalent to the emissions of more than 37 million passenger vehicles, or 1 in 7 vehicles on the road. As with the use of resources, more dramatic climate benefits can be had from preventing food from going to waste than from recycling it.

9 Food accounts for 21 percent of municipal solid waste, adding more waste to landfills and incinerators than any other product. This does not include food and beverages disposed of in other ways, such as down kitchen drains. Only about 5 percent of all food in the waste stream is currently recycled by composting or anaerobic digestion. As food scraps in landfills decompose, they produce methane, a greenhouse gas up to 86 times more powerful than carbon dioxide in terms of its global warming potential. Food waste is responsible for a minimum of 11 percent of all landfill-generated methane emissions in the United States—and that’s a conservative estimate. Many landfills are capped to capture and burn methane, but most food scraps decompose within the five-year time frame allowed before landfills are required to do this. Nevertheless, using this conservative estimate and considering only landfill emissions, food scraps in landfills produce as much emissions as about 3.4 million vehicles and account for about 9 percent of the total greenhouse gas footprint of food waste.

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**LOSSES IN GROCERY RETAIL**

10 In 2010, the USDA estimated in-store food losses at 43 billion pounds, equivalent to 10 percent of the total retail food supply.159 ReFED’s estimate is much lower, at 16 billion pounds.160 Either way, though, it’s a lot of food.

11 Perishables—baked goods, produce, meat, seafood, and, increasingly, ready-made foods—represent most of the waste in retail operations. According to the USDA’s analysis of retail losses in 2011 and 2012, produce alone accounts for $15.4 billion in losses annually. Loss rates averaged 12.3 percent for fruit and 11.6 percent for vegetables. That’s enough fruit to meet the government dietary guidelines for more than 5.3 million people and enough vegetables for nearly 3.9 million people every day of the year. Losses vary widely by produce type. For instance, the rate was only 2 percent for sweet corn and 4 percent for bananas versus 43 percent for papayas and 63 percent for turnip greens.

12 The USDA also reports that approximately 2.7 billion pounds of meat, poultry, and seafood are wasted each year at retail, along with nearly 9.3 billion pounds of dairy products. This is enough to meet the dietary guidelines for more than 2.3 million people for meat, poultry, and seafood and nearly 18 million people for dairy.

13 A survey of supermarket business leaders estimated that 10 percent of revenue is lost to spoilage, age dating, package damage, and markdowns, and that large national chains lose closer to 15 percent of revenue. In a separate study, the industry group Food Waste Reduction Alliance (FWRA) estimated retail-level food waste at 0.01 pound per dollar of company revenue—so a retailer with $1 billion in revenues typically produces 10 million pounds of food waste. Tesco reported levels of waste under 1 percent for almost all retail commodities.

14 Part of the allure of supermarkets is that they carry a vast array of products at every hour of the day—usually between 15,000 and 60,000 items. While convenient, this bounty presents a challenge for forecasting and inventory management and inevitably leads to waste. Some level of loss is simply considered a part of doing business. Industry executives and managers view a certain level of waste as a sign that a store is meeting quality control and full-shelf standards, meaning that blemished items are removed and shelves are fully stocked. According to a former president of Trader Joe’s, “The reality as a regional grocery manager is, if you see a store that has really low waste in its perishables, you are worried. If a store has low waste numbers, it can be a sign that they aren’t fully in stock and that the customer experience is suffering.”

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15 Furthermore, many retail stores operate under the assumption that customers buy more from brimming, fully stocked displays. This leads to overstocking and over-handling by both staff and customers and damages items on the bottom with the accumulated weight.

16 Overstocked displays are a problem in store delis and seafood cases as well as in produce sections. By one account, 26 percent of whole fish are not sold, yet, they are steadily stocked because stores like how they look in display cases. A survey of supermarket business leaders estimated that 10 percent of revenue is lost to spoilage, age dating, package damage, and markdowns, and that large national chains lose closer to 15 percent of revenue.

17 Stores are also increasingly offering ready-made food in their delicatessens and buffets. These items make up a significant portion of food lost at supermarkets and convenience stores. If these items are made on-site, they may be able to incorporate marginally damaged or nearly expired products. However, many of these products are made off-site or by outside vendors. As with produce, store managers often feel compelled to ensure these displays remain fresh and fully stocked. Rotisserie chickens, for instance, might be thrown away and replaced after four hours on display. One grocer estimated that his store threw away a full 50 percent of its rotisserie chickens, including many from the last batch of the day.

18 Retailers also typically discard products two to three days before the dates on their packages. Almost all of this food is still consumable but may have a limited remaining shelf life. In most states, it is not illegal to sell products after the date on the package, but stores don’t do so out of concern that their customers will be turned off. High consumer expectations about produce freshness also lead grocers to discard any items that appear to be past their peak. Packaging methods can also be a factor in waste levels. For instance, fresh beef placed on a disposable tray and covered in plastic wrap will take on a brown coloring much faster than beef in vacuum packing, which reduces oxygen inside the package. Although the quality of the meat is unaffected, its appearance will typically lead retailers to pull the product from the shelf. Packaging can also protect items, such as produce that is easily damaged from over-handling in the store, and extend shelf life through modified exposure to oxygen and moisture. Although additional packaging can help reduce wasted food and avoid the environmental impacts associated with wasting that food, there are still environmental impacts resulting from that additional packaging.

19 Products are also discarded due to damaged packaging or concluded promotions. Post-holiday discards, such as Valentine’s Day chocolate, and other seasonally featured products are often without a home after the appropriate season. In addition, many of the 20,000 or so new food products introduced each year may be discarded when they fail to sell.

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20 Produce arrives in preset quantities according to case size, limiting retailers’ ability to purchase the exact amount needed. For example, if a grocer wants 20 pounds of grapefruit but they come only in 42-pound cases, the store will be stuck with more than it can sell. This is particularly challenging for small groceries and convenience stores where product turnover is more limited. A separate problem with grouped products is that if one item in the package—for instance an apple in a bag or one egg in a carton—is damaged, often the whole thing will be thrown out.

21 Finally, staffing constraints, turnover, and poor training can cause problems. The tight margins of the retail sector have driven stores to reduce employee numbers, leading to fewer staff to perform functions that help keep food fresh and sell product, such as rotating and marking down products. The lower-wage nature of many supermarket jobs leads to high turnover, making it difficult to maintain well-trained staff, which can lead to mishandled

product.

**Examples of Streamlined Retail Operations, In-Store and Out-of-Store**

22 In 2014, Walmart launched a campaign to waste and damage less food in its supply chain and stores. It optimized forecasting, improved packaging, and altered displays. The company also expanded its Customer Value Program—which systematically discounts items approaching their peak quality date—beyond baked goods. In 2014, this discount program saved more than 30 million food items from becoming waste. It also developed a system to remove only damaged eggs from cartons rather than discarding the whole carton, leading to an estimated savings of 37 million eggs. And as of June 2016, Walmart had converted most of its private label products to carry a uniform “Best If Used By” date instead of the 47 different phrases that were previously used to indicate peak quality.

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23 Walmart also requires all suppliers of its private label goods to be certified according to one of the Global Food Safety Initiative standards (GFSI) rather than the hodgepodge of previous standards. An internal report showed that after implementation of these standards, which covered all such suppliers by the end of 2009, food recalls decreased by 34 percent and market withdrawals were reduced by 21 percent.

24 In addition to donating bakery items, Ahold USA freezes meat prior to its expiration and donates it to food bank partners as part of its Meat the Needs program. In 2015, the retailer donated more than $10 million worth of protein, accounting for one-third of their total food bank donations that year. Ahold also sends some unused food to nearby livestock farmers for feed and recently built its first anaerobic digester in Freetown, Massachusetts, to recycle remaining food waste.

25 In 2007, Stop and Shop/Giant saved an estimated $100 million by using alternative display approaches, stocking fewer types of perishables, and improving handling and forecasting. Item-by-item analysis was critical to determining how and when to alter inventory, since higher-level information was not specific enough.

26 In France, the startup Zéro-Gâchis (“Zero Waste”) helps retailers set up shelves of specific products approaching their best quality date and informs consumers about where to find these products through a smart-phone app. The company works with more than 100 supermarkets and rescues approximately 100 tons of food per month. In the first two years of operation, it saved consumers $1.3 million. Building on its success, Zéro-Gâchis is now working with several major supermarket chains to expand its operations.

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**LOSSES IN FOOD SERVICE**

27 U.S. restaurants (including full-service and quick-serve) are estimated to generate 22 billion to 33 billion pounds of food waste each year. Institutions—including universities, schools, hotels, health care facilities, and other locations with cafeterias or catering—generate an additional 7 billion to 11 billion pounds per year. Together, these outlets generate approximately two to four times the waste of grocery stores, retail supercenters, and wholesale distributors combined. One industry survey found that only 2 percent of the food discarded by responding national restaurant chains was donated.

28 The USDA does not explicitly estimate waste from the food service sector. This sector is, instead, lumped together with households in the “consumer” category, where combined losses were estimated at 90 billion pounds in 2010, or 21 percent of the total U.S. food supply.

29 Waste in restaurants and other food service can occur either in the kitchen (“pre-consumer”) or after food is served (“post-consumer”). Approximately 4 to 10 percent of food purchased by food service becomes pre-consumer waste. Common causes for pre-consumer waste include overproduction, trim waste, mishandling (e.g., overcooking or holding at the wrong temperature), or printed date labels (as with premade sandwiches or prepared salads).

30 Extensive menu choices also hinder proper inventory management since large menus require more ingredients on hand. Unpredictable sales fluctuations also make planning difficult. All-you-can-eat and buffet-style restaurants tend to have higher levels of pre-consumer waste than full-service restaurants, where food is largely made to order and overproduction can be more readily avoided. Centralized chain-restaurant management can also make it harder to control waste because, despite advanced inventory software, individual restaurants often lack flexibility to use food creatively. In addition, quick-serve restaurants must often adhere to strict time limits for prepared items. For example, McDonald’s has a policy that fries must be thrown out after 7 minutes and burgers after 20 minutes.

31 While data are limited and figures can vary widely depending on the circumstances, post-consumer waste often makes up the vast majority of overall food losses in certain restaurant settings, especially those where there is little on-site food preparation and therefore not much kitchen waste. Post-consumer waste can be caused by excessive portion sizes and service methods such as all-you-can-eat buffets and free drink refills, as well as the inclusion of bread, side dishes, and other items that consumers may not want.

32 Portion sizes have increased significantly over the past 30 years. From 1982 to 2002, the average pizza slice grew by 70 percent in calories, the average chicken Caesar salad doubled in calories, and the average chocolate chip cookie quadrupled. Today, portion sizes can be two to eight times larger than USDA or FDA standard serving sizes. This phenomenon is negatively affecting both how much we consume and how much goes uneaten. Of course, if restaurant patrons don’t finish their portions, they can take them home. On average, diners leave 17 percent of meals uneaten, but 55 percent of these leftovers stay on the table.

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**EXAMPLES OF EFFICIENCY IN FOOD SERVICE**

***Institutional Food Service***

33 LeanPath waste-tracking software estimates that use of its software cuts pre-consumer wasted food in half, which in turn reduces kitchen food purchases by 2 to 6 percent. For example, Michigan Tech University reduced wasted food by 50 percent and saved $1,000 per week. The MGM Grand Buffet in Las Vegas cut pre-consumer waste by 80 percent and saved an average of $7,500 per month. Boloco, a small Boston chain, reduced pre-consumer wasted food by 24 percent across its four locations.

34 Trayless dining in cafeterias has become a real food waste prevention success story in all-you-care-to-eat settings. An Aramark study of 186,000 meals served on college campuses found a 25 to 30 percent drop in wasted food, in addition to water savings of one- third to one-half gallon per person on days without trays, since trays don’t need to be washed if they’re not used. A Colgate University study found smaller water savings, at .13 gallons per person per meal. Furthermore, energy is saved by not having to heat as much dishwashing water.

35 Beginning in the fall of 2013, the State University of New York at Delhi began weighing student food waste and displaying the total amounts of wasted food each hour, day, week, and semester—along with the cost— on a monitor near the dish return area. As a result, student waste decreased by 1,000 pounds per week and 0.2 pounds per student from the pre-scale baseline measure. This small school of 1,800 students saved $2,000 per week in food costs.

36 In the fall of 2015, Bon Appétit Management Company committed to preventing and reducing waste by following the EPA Food Recovery Hierarchy. Each of its 650-plus cafés around the country launched a month-long waste reduction campaign, making weekly purchases of Imperfectly Delicious Produce or tracking their food waste annually through programs like the LeanPath software mentioned above. Additionally,

37 Bon Appétit pledged that by 2018, 80 percent of its sites will regularly donate their excess, wholesome food to people in need. All sites will divert food waste from landfills through practices like composting or redirecting to animal feed. Bon Appetit has also rolled out a new Food Standards Dashboard to track progress toward these and other company commitments.

38 Innovations in K–12 schools, such as salad bars and other “choice” bars, allow children to select their food and reduce waste. Small changes like having recess before lunch to help build up appetites and reduce the incentive to race through the meal significantly reduce wasted food. Allowing enough time for kids to eat also helps reduce waste while encouraging consumption of healthy items like fruit and vegetables. A study by Provokare showed that children were less likely to waste food if they helped prepare their own lunch boxes. The Smarter Lunchroom movement develops and shares best practices to improve the school lunch experience in the United States, and the USDA has issued guidance on how schools can reduce waste and donate surplus food.

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***Restaurants and Catering***

39 In 2015, Chef Dan Barber converted his Manhattan Blue Hill Restaurant into the pop-up WastED for a few weeks to showcase that food parts typically deemed unusable in the restaurant world are in fact suitable for consumption. The restaurant served a “rack of black cod” (using bones and fish left over after filleting), deep-fried skate cartilage, broken razor clams, and a veggie burger made with the pulp from a juicing operation. This stunt has inspired a wave of other chefs and restaurants. For example, fast-casual chain Sweetgreen began offering a salad of broccoli stalks, bread ends, and carrot peels. In another example, Ellary’s Greens in New York City serves a salmon burger made from the trimmings of its salmon fillet entrée.

40 From 2009 to 2014, the number of small plates and smaller portion items on menus across the country increased by 32 percent. A French restaurant, Les Arcades, offers four meal sizes indicated by four different colors, reducing wasted food by 40 percent.

41 Several buffet-style restaurants have fees for leftover food or pay-by-weight systems to reduce patron waste. Momoya Sushi in Mountain View, California, charges $5 for sushi that is uneaten. Similar restaurants have emerged in Japan, Hong Kong, Switzerland, and Saudi Arabia.

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**LOSSES AT HOME**

42 Households are responsible for the largest portion of all food waste. ReFED estimates U.S. household food waste totals 76 billion pounds, or 238 pounds of food per person annually. This costs $450 per person, or $1,800 per year for a household of four. The USDA estimates that 21 percent of the total food supply is lost at the consumer level, amounting to 90 billion pounds. However, the agency’s definition includes both households and “out of home” consumption (e.g., in restaurants), as mentioned earlier. Furthermore, total consumer-level losses may be even higher if we include surplus from home gardens, which one survey estimated at an additional 11.5 billion pounds.

43 Because it has undergone more transport, storage, and often cooking, throwing food away at the consumer level has a larger resource footprint than at any other point of the food chain. A McKinsey Consulting study reports that household losses are responsible for an average of eight times the energy waste of post-harvest losses.

Estimates vary as to how much of the food discarded in homes is edible. A study of 100 Seattle residents found that about one-third of food wasted in homes was edible, while two-thirds consisted of inedible scraps (such as banana peels, eggshells, and bones). Of the edible portion, about half was unused produce, one-third was uneaten leftovers, and the rest was uncooked other food.

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44 A study of 500 homes in the Vancouver area found that 53 percent of food waste at home was avoidable. NRDC’s own research of household food waste across three cities (613 households in Nashville, Denver, and New York) found that up to 68 percent of discarded food was edible, if “questionably edible” items such as potato peels were included.

Perishables make up the majority of household food losses due to the high volume of consumption and the tendency to spoil. In terms of total mass, fresh fruits and vegetables account for the largest household losses, followed closely by meat, poultry, fish, and dairy products. By rate of loss, fish and seafood rank highest for consumers, with 31 percent of available pounds going uneaten.

45 Consumers tend not to notice the food they throw out and to underestimate its implications. Several studies have found that approximately three-quarters of people believe they waste less food than the average American. Furthermore, studies find that even residents who keep daily diaries of their food waste underreport the amount of food they waste by about 40 percent, compared with what can be found in their garbage. Cheap, convenient food has promoted behaviors that undervalue fully utilizing purchases. As a result, the issue of wasted food is simply not on the radar of many Americans, even those who consider themselves economically or environmentally conscious.

46 One key driver of waste is confusion over date labels. Date labels on food are generally not regulated and are not meant to indicate food safety. Multiple dates, inconsistent usage, and lack of education around date labels cause consumers to discard food prematurely. In the United States, more than 80 percent of consumers report that they discard food prematurely due to confusion over expiration dates. Meanwhile, U.K. findings indicate that about 20 percent of avoidable wasted food in households is the result of date label confusion.

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47 Whether it’s single-household purchases or bulk buys, food sold in package sizes larger than needed can lead to food spoilage. Furthermore, store promotions that encourage bulk purchases or purchases of unnecessary products often lead consumers to buy foods outside their typical meal plan, which then leads to waste.

48 Poor storage habits can also drive waste. When items are hidden behind others in the refrigerator (or, to a lesser extent, in the freezer), waste becomes more likely. Most people like to keep their fridges well stocked, and given the sheer size of modern refrigerators, this can lead to wasted food. As food lingers in the fridge, uncertainty over how long foods keep and lack of knowledge about how to use items doom many food items to landfills.

49 Lack of meal planning and shopping lists, inaccurate serving estimates, and impromptu restaurant meals can lead to spoilage. Furthermore, much like restaurant portions, recipe serving sizes and plates have grown, growing portions along with them, and large portions can lead to uneaten food. In fact, the surface area of the average dinner plate expanded by 36 percent between 1960 and 2007, meaning you need to serve more food to fill it. Simply switching to a smaller plate could cut calories and waste. Serving sizes in the

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Joy of Cooking cookbook have increased 33.2 percent since 1996. That is, a recipe that was

said to serve 10 now “Serves 7” (or the ingredient amounts are greater for the same number

of servings). In some cases, this leads to overeating. In others, it simply leads to extra food in the trash.

50 Excess prepared food would not produce as much waste if Americans had a better attitude toward leftovers. While many Americans utilize leftovers in the same form or repurpose them into another meal, many more do not. In a 2015 survey, 53 percent of respondents said that they throw away leftovers at least weekly. And in households with children, that figure jumped to 70 percent.

51 Finally, time constraints and inconvenience can exacerbate the problem. Often, the most convenient option is not the least wasteful option. For instance, ordering in can feel easier than cooking produce on the

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52 brink of spoilage. This dynamic can lead to waste, even with all other best practices.

Food expenditures represent only 10 percent of the average American’s disposable personal income—a smaller proportion than in any other country. That’s also half the percentage it was in the 1950s, which means the financial incentive for many of us to be more careful with our food is much smaller. Nevertheless, in the United Kingdom, it has been demonstrated that people do save money by wasting less food, and that they tend to spend about half that money to “trade up” to more premium grocery products.

53 Household waste is not inevitable, nor has it always been common. Older generations, especially those who experienced or had a parent who experienced World War II or the Great Depression, tend to waste less. As mentioned earlier, the average American wastes 50 percent more food today than he or she did in the 1970s. In a 2015 survey, 84 percent of Americans above 65 years old estimated that they waste less food than the average American and exhibited many of the behaviors associated with waste reduction. An analysis of residential garbage in the United Kingdom showed that this age group generated approximately 25 percent less food waste than similar-size but younger households.

54 Consumers in developing countries do not waste nearly as much food as their European or American counterparts. The FAO estimates per capita food waste by European and North American consumers at 210 to 250 pounds per year, while consumers in sub-Saharan Africa and South or Southeast Asia waste a mere 13 to 24 pounds per year per capita. Wasting food is, in many cases, a luxury. However, once we account for all the waste and the environmental and social implications, it’s not necessarily one we can afford.

**EXAMPLES OF EFFICIENCY AT THE CONSUMER STAGE**

55 Consumers can be a powerful waste reduction force. In the United Kingdom, households reduced avoidable food waste by 21 percent from 2007 to 2012. Over that same period, both wasted food and purchases decreased by about 500 grams (1.1 pounds) per

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person per week, which resulted in total food purchases remaining constant while the population increased 4.5 percent. Furthermore, consumers there chose to spend about half the money saved by wasting less food to “trade up” to more premium food and beverage products. Example strategies to reduce consumers’ waste include:

**56 Tools and information:** Consumers can find waste reduction inspiration all over the Internet through blogs, recipes, reference information, and tips. SavetheFood.com offers tips for planning and shopping, optimal storage, reviving food on the brink, and freezing. Apps and websites on meal planning, storage guides, and shelf life advice show us how to make the most of our food. Education programs like Food: Too Good to Waste provide outreach tools to actively engage and educate consumers.

**57 Flexible purchase sizes:** Allowing customers to customize purchase quantities can reduce waste. In Austin, a grocer called in.gredients sells virtually all of its goods in bulk bins. This also reduces packaging waste by encouraging reusable containers. In a 2013 poll, Americans identified smaller quantities as the best way supermarkets could help minimize household wasted food.

**58 Food sharing:** Many consumers avoid waste by sharing extra food with family and friends. Online platforms and apps offer new ways to share food with neighbors or those in need. For example, the Ample Harvest website enables backyard gardeners
to share their excess produce with local hunger relief agencies. The Leftover Swap app helps neighbors share leftovers. The French start-up Partage Ton Frigo (“Share Your Fridge”) helps offices implement common shelves in shared refrigerators to allow people to share extra food at work. In Berlin, the organization FoodSharing set up fridges in the street to facilitate the exchange of excess food.

**59 Backyard gleaning:** Some households avoid wasting food by allowing volunteers to glean their backyard fruit trees. Several organizations facilitate these backyard gleanings and distribute that fruit to food relief organizations. Prominent examples include Food Forward in Los Angeles, the Portland Fruit Tree Project, City Fruit in Seattle, and the Baltimore Orchard Project.

**60 Community events:** Around the globe, food waste awareness events are building momentum. The nonprofit group Feedback organizes events called Feeding the 5000—giant feasts that amply feed 5,000 people with rescued food. The group has held dozens of these events in Europe and the United States since 2009. Similar Disco Soup events combine the positive disco spirit with cooking food that otherwise would be thrown away. Hundreds of Disco Soups have taken place in various public spaces in more than 30 countries, including the United States.

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**FOOD DONATION AND REDISTRIBUTION**

61 One of the ironies of today’s food system is that enormous amounts of food are wasted at the same time that more than 42 million people in the United States lack a secure supply of food to their tables. In fact, only about 3 to 10 percent of unsaleable food from manufacturers, retailers, restaurants, and food service providers combined is donated each year. At the farm level, only a small portion of the largely undocumented losses of fruits and vegetables makes its way to the hunger relief system. We can do much, much better.

62 Recent growth in donations reflects these opportunities. Donations to the Feeding America network increased by 71 percent from 2011 to 2016, due in part to higher volumes of fresh produce and more donations from the retail sector. Similarly, Food Donation Connection, which focuses on prepared food rescue, has seen a tripling of donations in the past ten years, topping 50 million pounds in 2016. Donations of fresh produce to California’s Farm to Family increased by 64 percent from 2010 to 2016.

63 Barriers remain, however, with transportation topping the list. Indeed, 41 percent of respondents in a survey of manufacturing, retail, and restaurant businesses cite transportation from the donor’s location as the main barrier to donating food. While donors receive tax benefits for their contributions, nonprofit food recovery organizations typically bear the cost and responsibility of transporting donated food to a central warehouse or to charitable organizations that directly serve needy individuals. Many lack adequate transportation capacity, particularly for perishables like meat, dairy, and prepared foods that need to be chilled during transport.

64 Transportation needs are especially acute for donations of prepared food from restaurants and institutional food service, which are typically made in smaller quantities from more disparate locations and require quick turnaround. Acknowledging that adequate food rescue infrastructure benefits both donors and local communities, Walmart donated 180 new refrigerated trucks to hunger relief agencies around the country in 2013.

65 Potential donors have also cited liability concerns as a key barrier to donating food, although this is changing as existing protections become more widely understood. The Bill Emerson Food Donation Act, signed into law by President Clinton in 1996, protects donors from food safety liability when donating food to a nonprofit organization. Furthermore, no food donation recipient has ever sued a food donor in the United States. Some companies still cite fear of negative publicity if donated food is linked to illness. However, as more large companies institute national food donation programs, these concerns appear to be diminishing.

66 It should be noted that while food donation provides immediate relief to those without enough to eat, it does not address poverty and the other underlying conditions that drive hunger. In addition, as rates of diabetes, hypertension, and other diet-related diseases rise, some agencies are limiting receipt of foods with little nutritional value.

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***Examples of Innovative Food Recovery***

67 Food Donation Connection (FDC) facilitates food rescue nationally and internationally, focusing largely on prepared food donations from national chain restaurants. Since 1992, FDC has rescued more than 500 million pounds of food and currently works through a network of 10,000 charitable organizations. Their donors include Olive Garden, Red Lobster, Outback Steakhouse, Pizza Hut, Chipotle, and Cheesecake Factory, as well as retailers like Whole Foods Market. FDC received more than 50 million pounds of donations in 2016.

68 D.C. Central Kitchen rescues grocery store and farm food that would otherwise be thrown away, while also creating jobs. Its Culinary Job Training program, which has graduated more than 100 classes since 1989, teaches cooking skills to adults facing high barriers to employment, such as a history of incarceration, homelessness, addiction, or trauma. Trainees learn by preparing 5,000 free meals for homeless shelters every day. The organization’s revenue-generating Fresh Start Catering employs Culinary Job Training graduates. D.C. Central Kitchen also helped catalyze Campus Kitchens, which now operates on more than 50 high school and college campuses and rescues a combined one million pounds of food annually.

69 Launched in June 2015, Daily Table is a Boston not-for- profit retailer that sells excess, healthy food sourced, mostly in the form of donations, from a network of growers, supermarkets, and manufacturers. Daily Table makes prepared food on-site from some of these donated goods.

70 The Food Recovery Network (FRN) was launched in 2011 at the University of Maryland and quickly spread to 200 campuses across the country. Under its model, students recover food from college dining settings and deliver it to nearby food rescue organizations. As of early 2016, the group had recovered 1.6 million pounds of food.

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71 Various electronic platforms have emerged to help connect surplus food with recipients, making it easier for a food business to find a recipient for its donations and facilitate transport of products. These vary from apps like Zero Percent, Copia, and Re-Plate, which connect businesses to food pantries and soup kitchens, to larger-scale efforts like Feeding America’s MealConnect, an online marketplace for surplus foods, connecting donors and food banks across the supply chain. This website helped rescue 208 million meals between 2014 and 2016 and expanded in 2017 to link smaller food donations with local soup kitchens or food pantries.

72 The Pennsylvania Agricultural Surplus System (PASS), funded by the state, provides resources to cover the cost of harvest, processing, packaging, and transporting excess produce for donation to charitable organizations focused on food security. In the pilot program, the Central Pennsylvania Food Bank acquired more than 100,000 pounds of apples and Pennsylvania growers and pickers recouped $41,180.

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73 The California-based Waste Not OC Coalition is a public-private partnership spearheaded by the Orange County public health department. The coalition facilitates the donation of healthy surplus foods from food service to food pantries, addresses liability concerns, maintains a detailed database of food pantries, and works with Yellow Cab of Orange County to help transport surplus foods. Since July 2014, the coalition has saved more than 360 tons of food from landfills—enough for more than 500,000 meals.

74 Philadelphia’s Drexel Food Lab, a research group composed of culinary arts and food science students, develops low-cost, simple recipes to repurpose surplus food commonly wasted by supermarkets into veggie chips, jams, and smoothie bases. These recipes are used at supermarkets and have the potential to support new local jobs. One study estimated that if turned into a social enterprise that bought the surplus food from an 11-store supermarket chain, added value through processing, and then resold it to the supermarket or another retailer for sale to consumers, these products could generate approximately $90,000 in monthly revenue across the supply chain.

75 To help cities improve food donation, NRDC is developing a model to estimate the potential volume of food donations in a given city, using Denver, Nashville, and New York as pilots. In Denver, NRDC is also projecting the type and size of investments
in food recovery and rescue infrastructure (such as transportation, cold storage, and staffing) that would be needed for the city to fully realize its potential for food donation. It is also comparing this potential to Denver’s food insecurity data to assess the degree to which expanded food donation could reduce the “meals gap” among the city’s food-insecure populations.

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Gunders, Dana et al. “Wasted: How America Is Losing up to 40 Percent of its Food from

 Farm to Fork to Landfill.” *NRDC.* August 2017, [www.nrdc.org/sites/default/files](http://www.nrdc.org/sites/default/files)

 /wasted-2017-report.pdf.