

REPORT

WASTED:

HOW AMERICA IS LOSING UP TO 40 PERCENT OF ITS FOOD FROM FARM TO FORK TO LANDFILL

SECOND EDITION OF NRDC'S ORIGINAL 2012 REPORT



Back in 2012, NRDC's work on sustainable agriculture caused us to stumble upon shocking numbers about how much food was going to waste across the United States. The further we dug, the more unbelievable we found the situation. We kept saying to ourselves, "These numbers can't be true, because if they were, everyone would be talking about them." And yet, very few people were. This led us to release a report in August 2012 entitled *Wasted: How America Is Losing up to 40 Percent of Its Food from Farm to Fork to Landfill*. To our surprise, that report landed on CNN's Breaking News headlines and circled the globe in just about every major news outlet. It helped spark a national dialogue about how much food is going to waste and what can be done about it.

Just three short years later, in the fall of 2015, the U.S. Department of Agriculture and the U.S. Environmental Protection Agency announced federal targets to cut food waste in the United States by 50 percent by 2030. This and other markers of progress show us just how far awareness of wasted food has come over a short period of time.

While data are still quite limited, and it's therefore difficult to say whether we are actually wasting less food than in 2012, much progress has occurred. We therefore felt it was appropriate to publish an updated version of our *Wasted* report. Like the original version, this report will answer two questions: "What are the leading drivers of wasted food across the different stages of the supply chain?" and "What can we do about it?" We include updated numbers where available and new examples of emerging solutions. We also chronicle key elements of progress made since the last report was released, five years ago. Finally, we conclude with recommendations on how to further this progress in the years ahead.

Authors

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About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 2.4 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at nrdc.org.

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Executive Summary

OUR GRAND INVESTMENT IN WASTED FOOD

America does not eat 40 percent of its food.¹ If the United States went grocery shopping, we would leave the store with five bags and drop two in the parking lot. And leave them there. Seems crazy, but we do it every day.

All told, America throws out more than 1,250 calories per day per person, or more than 400 pounds of food per person annually.² That's a loss of up to \$218 billion each year, costing a household of four an average of \$1,800 annually.³ At the same time, 42 million Americans face food insecurity—and less than one-third of the food we throw out would be enough to feed this population completely.⁴ To place this in a global context, the average American consumer wastes 10 times as much as his or her counterpart in Southeast Asia or sub-Saharan Africa.⁵

We leave entire fields unharvested, reject produce solely for cosmetic reasons, throw out anything past or even close to its “sell by” date, inundate restaurant patrons with massive portions, and let absurd amounts of food rot in the back of our fridges. In our diverse nation of 322 million people, wasting food emerges as an embarrassing unifier. No matter our age, gender, economic status, or education level, we all waste food.⁶

MORE THAN JUST FOOD

THE U.S. WASTES TONS OF RESOURCES WHEN WE WASTE FOOD

1,250 CALORIES PER PERSON PER DAY
THAT IS HALF OF THE RECOMMENDED DAILY INTAKE FOR ADULTS

19%
OF ALL
U.S.
CROPLANDS
THAT IS MORE
LAND THAN ALL
OF NEW MEXICO

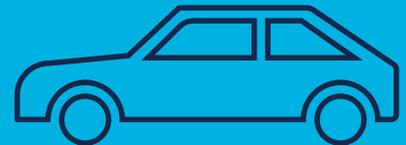
21% OF U.S. LANDFILL
CONTENT



THE NO. 1 CONTRIBUTOR BY WEIGHT

18%
OF ALL
FARMING
FERTILIZER
WHICH CONTAINS
3.9 BILLION POUNDS
OF NUTRIENTS

2.6% OF ALL U.S. GREENHOUSE
GAS EMISSIONS ANNUALLY



37 MILLION PASSENGER VEHICLES' WORTH

21% OF THE U.S. AGRICULTURAL
WATER USAGE



MORE THAN: TEXAS + CALIFORNIA + OHIO

\$218,000,000,000

WHICH IS EQUAL TO 1.3% OF THE U.S. GROSS DOMESTIC PRODUCT (GDP)

And it's not just food going in the trash. Even with the most sustainable practices, our food system uses enormous resources. Food and agriculture consume up to 16 percent of U.S. energy, almost half of all U.S. land and account for 67 percent of the nation's freshwater use.^{7,8,9} Those resources are used in vain if the food is never eaten, wasting up to about one-fifth of U.S. cropland, fertilizers, and agricultural water.¹⁰ Food waste is also a significant contributor to climate change, responsible for at least 2.6 percent of all U.S. greenhouse gas emissions.¹¹ That's equivalent to more than that of 37 million cars, or 1 in 7 cars on the road.¹² The majority of those greenhouse gases are released by growing the food, though a portion is released as methane as food rots in landfills. In fact, food is the number one contributor to landfills today.¹³

The implications of this problem are only going to get worse. The global population in 2050 is projected to demand 1.5 to 2 times more food than we needed in 2005.¹⁴ But that assumes current waste levels. Wasting less food can help stabilize food demand even as population grows, as was demonstrated in the United Kingdom, where the population grew 4.5 percent but total food demand stayed constant (while wasted food declined).¹⁵ Before we convert more undeveloped lands to farmlands to produce the food we'll need, we must make better use of what we have.

Americans can solve this problem. We weren't always this wasteful. In fact, Americans waste 50 percent more food today than we did in the 1970s, which means we could easily waste less today.¹⁶ A 2017 study found it may even be good business to do so, with an average 14-fold financial return on investment for companies implementing food waste reduction efforts.¹⁷ Turning this ship around will require a suite of solutions, including modified supply-chain operations, enhanced market incentives, increased public awareness, and adjusted consumer behavior. While much work remains, the good news is that Americans have made heartening progress toward wasting less food since 2012, and momentum continues to build. This report details the progress made since 2012 and discusses the myriad solutions that can bring us closer to a more efficient food system with less food wasted.

GROWING MOMENTUM

In 2012, NRDC published *Wasted: How America Is Losing up to 40 Percent of Its Food from Farm to Fork to Landfill*, helping to spark a national movement to waste less food. This second edition updates and expands the previous report. And there is much to report. National and corporate goals have been established, policies have progressed, and consumer awareness is spreading like wildfire.



We now have more research on the topic. Many newly published studies are cited throughout this report. In addition, the Food Loss and Waste Protocol established a global standard for quantifying and reporting food waste, thus enabling collection of comparable data in years to come.¹⁸ Unfortunately, though, current data are still quite limited, and it is difficult to say we are actually wasting less food today.

Progress on the policy front, however, has been significant. In September 2015, the U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA) set a national goal to cut food waste by 50 percent by 2030,¹⁹ aligning with similar targets set in 2015 in the United Nations' Sustainable Development Goals.²⁰ As part of the omnibus budget package that closed out 2015, Congress improved food donation tax incentives and extended them to businesses of all sizes.²¹ A spate of food waste legislation was then introduced. First, the Food Recovery Act, the first-ever explicit food waste bill in the U.S., was introduced to Congress at the end of 2015.²² It was followed by the Food Date Labeling Act and the Food Waste Transparency Act.^{23,24} While none of these were passed into law, their introduction indicates progress. In December 2016, the USDA announced guidance toward a more standardized food date labeling system to help reduce premature disposal of food. In addition, nine states added tax incentives for donating food that would otherwise be wasted.²⁵ Five states required at least some businesses to recycle food instead of throwing it away, and in some cases those laws prioritize food recovery and prevention of surplus.²⁶

The food industry has taken some proactive steps as well. In 2015, the Consumer Goods Forum, a global consortium of more than 400 retailers and manufacturers, committed to halve food waste within the operations of its members by 2025.²⁷ And in 2016, 15 leading U.S. companies were named USDA Food Loss and Waste 2030 Champions when they committed to halve food waste by 2030.²⁸

In January 2017, in line with the USDA's efforts, two leading food industry associations announced voluntary guidelines to standardize food date labels in order to reduce the confusion leading consumers to throw food out prematurely.²⁹ The Food Waste Reduction Alliance, made up of three food industry associations and founded in 2011, made progress by collecting biannual surveys from members and publishing best practice guides for the industry.

In contrast with 2012, when there was little discussion of the topic, wasting less food has become a regular part of the conversation around a sustainable food future. The number of media articles about food waste, for instance, grew 25 percent per year from 2011 to 2016, amounting to almost three times as many articles in 2016.³⁰ The topic had over 90,000 Twitter mentions from October 2015 to September 2016.³¹ In 2015, the issue was even a feature of *Last Week Tonight with John Oliver*, HBO's comedic news program, with nearly eight million live and online views.³²

At the consumer level, a 2015 consumer survey found notable awareness, with 42 percent of respondents having heard or seen something on wasted food in the past year.³³ And 45 percent of respondents correctly identified the most recent estimate of U.S. wasted food (40 percent).³⁴ In a 2016 poll of more than 6,700 adults, 74 percent

reported that the issue of wasted food was personally important or very important to them.³⁵

As an organization, NRDC, too, is stepping up its efforts to reduce wasted food. In April 2016, we partnered with the Ad Council to launch Save the Food, a national public service campaign to reduce wasted food in the United States.³⁶ The digital, video, print, radio, and outdoor assets of the campaign have appeared in countless outlets across the country, including on national television, in Times Square, on buses in Chicago, and on waste trucks in California. As of this writing, the campaign has generated almost \$45 million in donated media. We are also working on models for city governments to address wasted food, collecting original data on residential wasted food, creating tools to estimate recoverable food, and engaging in policy efforts at state and federal levels.

MOVING FORWARD

Yes, we have seen promising momentum and some concrete progress. But there is much work ahead. The scale and complexity of the wasted food issue cannot be ignored, yet we also cannot wait to act. We must now lay the foundation for progress over the years and decades to come.

The benefit of reducing future greenhouse gas emissions, water usage, energy usage, and land-use change by cutting wasted food is massive—especially given growing resource constraints. Below are specific actions that the government, private sector, and consumers can take to make a significant dent in America's food-wasting epidemic.

The federal government should use its administrative tools to meet the national food waste reduction goals. It should prioritize preventing excess food, then feeding people in need, and then recycling food waste. More specifically, the federal government should:

- **Fund** expanded infrastructure and innovative solutions that prevent wasted food by setting aside portions of existing grant funds.³⁷
- **Conduct or fund more detailed studies** to measure and document the extent, nature, and drivers of wasted food along the food supply chain.
- **Provide federal agency parameters** to standardize food date labels at the USDA and Food and Drug Administration (FDA), and update FDA Food Code guidelines with model food safety policies that pertain specifically to donated food.
- **Engage and educate** the public through national public service and school campaigns.
- **Lead by example** by requiring federal agencies to measure and report wasted food, to donate excess food and compost whenever possible, and require similar actions of their vendors.



Congress should pass laws that minimize the amount of food wasted. More specifically, Congress should:

- **Incentivize food waste reduction strategies in the next Farm Bill.** These strategies could include providing funds for pilots, innovation, and improved infrastructure; implementing critical research to better understand issues and develop solutions; expanding value-add processing capacity; and educating consumers and children alike.
- **Standardize and clarify date labels** so that consumers stop throwing out food (and money) due to misinterpretation.
- **Expand and clarify liability protections and tax incentives** to remove barriers to food donation.

State and local governments should:

- Partially or fully **ban food from being sent to landfills or incinerators**, with a **dual goal of reducing the generation of wasted food overall.**
- **Set targets**—like adopting the national goal to reduce food waste by 50 percent by 2030—and establish a baseline to measure progress.³⁸
- **Implement campaigns** that inform people and inspire them to waste less food in their jurisdictions.
- **Engage local businesses and community members** through technical assistance and recognition programs.
- **Incentivize food donations and expand capacity of food recovery organizations** to accept surplus food. Incentives could include tax credits for farmers donating food, grants for added food rescue infrastructure, or community partnerships that expand food rescue capacity while enhancing the nutritional value of donated food.

Businesses should:

- **Conduct food waste audits** to understand the scope and opportunities within their operations.
- **Set reduction goals and publicly report progress.** Setting achievable short-term goals can help motivate and direct action across companies.
- **Focus on reducing meat and dairy waste.** Waste reduction efforts aimed at these food categories will have the biggest ecological and often financial bang for the buck.
- **Align with standardized food date labels.** Companies should align date labels on their products with the guidelines recently established in the food industry.
- **Adopt industry best practices and create new ones.** This report provides recommendations for each stage of the supply chain, but the solutions will need to be customized. In addition, businesses can create new measures to shift procurement, preparation, service, and merchandising practices—and then share the successful approaches with others.
- **Invest in innovative** entrepreneurial efforts and additional research.

Every American can help reduce waste by adopting better food management practices, like learning when food is (and isn't) bad to eat, correctly interpreting date labels, and buying the right amount of food to begin with. We can also take pains to store, cook, and eat food with an eye to reducing waste, and we can teach our children to value food. Many more tips and suggestions are outlined in depth at www.savethefood.com and in the book *Waste-Free Kitchen Handbook: A Guide to Eating Well and Saving Money by Wasting Less Food*.

SUMMARY OF DRIVERS AND REMEDIES OF FOOD WASTE BY SUPPLY CHAIN STAGE

MAIN DRIVERS	POTENTIAL REMEDIES
PRODUCTION	
<p>WEATHER/DISEASE: Natural phenomena harm crops and lead to excess planting to hedge against risk.</p> <p>MARKET CONDITIONS: A crop's price at time of harvest may not warrant the labor and transport costs required to bring it to market.</p> <p>BUYER STANDARDS: Selective harvest for appearance, shelf life, and other requirements leads to crops left in the field.</p> <p>LABOR SHORTAGES: When harvest timing is critical, a labor shortage can lead to lower harvest rate.</p> <p>FOOD SAFETY THREATS: Actual or perceived food safety concerns can lead to huge losses of product.</p> <p>ORDER CHANGES: Unpredictable order fluctuations and last-minute cancellations lead to product without a home.</p> <p>BYCATCH: Unintended and/or unmarketable seafood species are caught during fishing, but not sold.</p>	<p>Broaden cosmetic standards to encompass a wider array of physical attributes.</p> <p>Expand secondary markets for items that do not meet highest cosmetic standards and alternative fish species.</p> <p>Expand farm-level food recovery via paid "concurrent picking", increased tax incentives for donating unsaleable, edible food to food banks, and funding to cover transportation and infrastructure for fresh food donations.</p> <p>Incorporate regional food networks, which can lead to less transport and sometimes less culling for short-lived products.</p> <p>Use targeted gear to reduce bycatch in fishing.</p>
PROCESSING	
<p>TRIMMING: Removal of edible but undesirable portions (peels, stems, skin, fat) along with inedible portions (bones, pits).</p> <p>PROCESSING INEFFICIENCIES: Some steps in operations may lose more edible food than necessary.</p> <p>EQUIPMENT, PACKAGING, AND FORECASTING ERRORS: Mistakes and malfunctions can lead to surplus or unsaleable product.</p>	<p>Reengineer production processes and product designs.</p> <p>Develop secondary uses and new food products from trimmings, peels, and other by-products. If not edible for humans, diversion to animal feed or compost facilities.</p> <p>Optimize product size to accommodate smaller or customized portions.</p> <p>Employ standardized system of date labels to reduce confusion among consumers.</p>
DISTRIBUTION	
<p>IMPROPER HANDLING: Overhandling, improper temperature, lengthy transportation, and disruptions to cold chain can lead to damaged product.</p> <p>FOOD EXPIRATION: Order changes and backups at loading docks and ports of entry can take up precious shelf life, causing product to pass contracted shelf life requirements</p> <p>REJECTED SHIPMENTS: Rejected shipments will have shorter shelf life and limited buyers, making them difficult to sell before spoiling.</p>	<p>Ensure proper training for handling and storage.</p> <p>Establish online marketplaces that facilitate sale or donation of short-life product or rejected shipments.</p> <p>Expand infrastructure enabling food rescue organizations to accept fresh food donations.</p>
RETAIL: IN STORE	
<p>STOCK MANAGEMENT: Large inventories, full shelves, and improper stock rotation can lead to excess, old, or damaged product.</p> <p>DISPLAYS: Excessive product may be displayed in order to create the effect of abundance, which is believed to increase sales.</p> <p>PREPARED FOODS: Perishables in the deli, bakery, and ready-to-eat sections are discarded after a certain period of time.</p> <p>DATE LABELS: Though still consumable, products within 2-3 days of the date on their package are removed from shelves.</p> <p>PACKING: Packaging methods can affect shelf life, and grouped products can be discarded when a single item in the group goes bad. Additionally, inflexible case sizes force smaller stores to order more than they expect to sell.</p> <p>PROMOTIONAL PRODUCTS: The passing of holidays and the high failure rate for new food items lead to increased discards.</p> <p>STAFFING CHALLENGES: With low staffing, there is less labor to prepare food on site and to rotate stock, leading to less flexibility in repurposing minimally damaged products. High turnover and poor training increase mishandling.</p>	<p>Streamline inventory by identifying opportunities to reduce number of items available and/or change ordering patterns.</p> <p>Discount older and slightly damaged items instead of removing them, increasing likelihood of sale and giving willing customers a bargain.</p> <p>Redesign produce, deli, and seafood displays using platforms, smaller bins and bowls, or other props to achieve appearance of abundance with less excess product.</p> <p>Improve packaging methods, such as vacuum-packing meat, to ensure that repackaged product retains quality and shelf life.</p> <p>Allow prepared foods to sell out near closing time without replenishing.</p> <p>Utilize damaged product in prepared food offerings.</p> <p>Improve training of staff on product handling and stock rotation.</p> <p>Increase donations from stores to those in need, including of meat, dairy, and produce.</p>

SUMMARY OF DRIVERS AND REMEDIES OF FOOD WASTE BY SUPPLY CHAIN STAGE

MAIN DRIVERS	POTENTIAL REMEDIES
RETAIL: BEYOND STORE	
<p>CONTRACT TERMS: Rigid contract terms can cause growers to overplant to ensure contracts are filled. Last-minute order changes can leave suppliers with excess product.</p> <p>COSMETIC STANDARDS: Aesthetic requirements imposed by the market lead to unharvested and culled edible produce upstream.</p> <p>REJECTED SHIPMENTS: By the time a shipment is rejected, its contents have a shorter shelf life and may be difficult to sell elsewhere before spoiling.</p> <p>MARKETING AND BULK PROMOTIONS: These can lead consumers to purchase unnecessary goods that are ultimately not eaten once in the home.</p>	<p>Increase flexibility in contract terms and grading standards and share risks of farming and mis-forecasting across supply chain.</p> <p>Experiment with offering lower-cosmetic-grade produce to determine viability.</p> <p>Adjust promotions to avoid excessive purchase of one item, such as offering half off or mix-and-match rather than two-for-one deals.</p> <p>Educate consumers on food quality, safety, and expiration.</p> <p>Enable purchase of smaller or customized portions, such as through bulk bins and staffed deli counters.</p> <p>Hide sale date information on products via codes or otherwise so customers are not confused by “sell by” dates.</p>
FOOD SERVICE	
<p>PORTIONS: Large and inflexible portions lead to diners not eating everything on their plate.</p> <p>EXPANSIVE MENU OPTIONS: Extended menus complicate inventory management and require more ingredients to be kept on hand. All-you-can-eat offerings have particularly high waste.</p> <p>SALES FLUCTUATIONS: Bad weather and unpredictable factors make inventory planning difficult.</p> <p>KITCHEN PRACTICES: Overproduction, trim waste, mishandling, and poor inventory management. High staff turnover exacerbates these problems.</p> <p>RIGID MANAGEMENT: Managers of chain restaurants are often not allowed to adjust for local demand and creative inventory use. Fast-food chains often have strict guidelines about how long items can sit after preparation before they must be discarded.</p> <p>SCHOOL LUNCH RESTRICTIONS: Schools may not implement practices that encourage lunch to be eaten, such as providing adequate or well-timed lunch periods and allowing students to choose components of meals.</p>	<p>Adapt menus to reduce menu choices, use specials to flush excess inventory, and repurpose food.</p> <p>Provide flexible portions through half orders, choice of sides, or smaller portions with optional refills.</p> <p>Scale back production by using smaller batches and pans, cooking to order, using smaller display containers, and reducing end-of-day production.</p> <p>Remove trays in all-you-can-eat cafeterias and buffets to discourage consumers from taking more than they’ll eat.</p> <p>Encourage diners to take home leftovers in low-impact containers.</p> <p>Invest in staff training and engage staff through rewards or incentives to participate in waste reduction.</p> <p>Conduct waste audits to understand patterns of excess.</p> <p>Offer low-waste catering options that have smaller quantity buffers, with clients acknowledging risk of running out.</p> <p>Increase donations and learn about benefits, including liability protections for food donors and tax benefits of food donations.</p> <p>Implement techniques in K-12 school lunchrooms such as salad bars, choice of side dishes, longer and later lunch periods, and share tables that allow sharing of untouched foods.</p>
CONSUMERS	
<p>LACK OF AWARENESS AND INFORMATION: Many consumers are not aware of how much food they waste or its implications. Some also lack information or skills to properly store and “use up” food.</p> <p>CONFUSION OVER DATE LABELS: Multiple dates, inconsistent usage, and lack of education around date label meanings cause consumers to discard food prematurely.</p> <p>POOR STORAGE: Food spoils in homes due to suboptimal storage, poor visibility in refrigerators, partially used ingredients, and misjudged food needs.</p> <p>POOR PLANNING: Consumers may overbuy because they fail to plan meals, fail to use a shopping list, inaccurately estimate what is needed for meal preparation, or decide on impromptu restaurant meals.</p> <p>IMPULSE AND BULK PURCHASES: Promotions encouraging unusual or bulk purchases result in consumers buying foods outside their typical needs, and these foods may not be consumed.</p> <p>OVERPRODUCTION: Preparing more food than needed can lead to waste unless leftovers are saved and consumed.</p>	<p>AT POLICY LEVEL:</p> <p>Simplify and streamline date labels to reduce consumer confusion about product safety.</p> <p>Educate and encourage better food management by consumers, including on meal planning, careful shopping, proper storage, safe food handling, food salvage techniques, etc.</p> <p>Increased infrastructure for curbside collection of compostable food scraps and inedible portions.</p> <p>BY EACH AND ALL OF US:</p> <p>Shop wisely by planning meals, using shopping lists, purchasing accurate quantities, and avoiding impulse buys.</p> <p>Interpret date labels as estimates of top quality rather than end dates for safety (unless the words “use by” appear before the date).</p> <p>Prepare appropriate amounts of food and save leftovers.</p> <p>Freeze food before it spoils, including milk, cheese, eggs, and meat.</p> <p>Declutter the kitchen and refrigerator so that items do not get lost.</p> <p>Share extra food with family, friends, or neighbors through leftover swaps, share tables or fridges, and apps that facilitate exchange.</p>