

Let's Get to Work: Recommendations for a More Efficient Food System

Despite the abundant progress of the past five years, plenty of work remains. We are moving from a period of awareness to one of action. Now is the time to lay the foundation upon which many years of work will build. Comprehensive research and data are still lacking. A concrete implementation plan to achieve the federal targets and bold federal policy are still needed. And businesses must focus on reducing food waste in their own operations and within their sphere of influence with suppliers and consumers. Strategic action on these fronts can propel us toward a more efficient and secure food system.

The ReFED report analyzed a set of 27 specific solutions and found that those solutions could not only cut food waste by 20 percent but generate 15,000 new jobs, double recovered food donations to nonprofits (adding 1.8 billion meals per year), reduce freshwater use by up to 1.5 percent (1.6 trillion gallons annually), and avoid nearly 18 million tons of greenhouse gas emissions per year.³⁷⁹ Ultimately, we need to see shifts in consumer behavior, supply chain operations, market incentives, policy, and public awareness to make these changes possible.

Wasting food wastes everything. We are well poised to make a significant dent in the amount of food wasted, and to do so now. Momentum on the topic is palpable. Let's harness that energy and implement solutions that we know work while also fueling innovation. With increased action and better ways to measure change, we can take on the challenge of wasting less food—and succeed. Here we offer key recommendations for getting there.

FEDERAL GOVERNMENT

In September 2015, the USDA and EPA announced the first-ever national target to reduce food waste across the United States, calling for a 50 percent reduction by 2030. Executive and congressional action will be essential to meeting this goal.

Provide targeted funding for food waste solutions.

Funding is necessary to prove new models, build infrastructure, promote education, and otherwise reduce food waste. The USDA, EPA, and other agencies should use existing grant programs to allocate funds for innovative food waste solutions.³⁸⁰ To enable increased donation of surplus foods, the government should fund improved food rescue capacity through infrastructure (e.g., food storage, transport, and processing facilities) and staffing. There is particular need among food pantries and direct service organizations.

Improve measurement. Current national data on food waste are limited. Filling the gaps will help identify the

most necessary action points and enable us to track progress. This can be done by:

- **Improving current federal data:** Create more robust and actionable baseline data against which progress can be measured. While further research could improve data on all fronts, current federal data on retailers and households are relatively solid. In other areas, however, research is in much need of improvement. For example, there are very little data on farm losses, and current consumer-level estimates inaccurately apply household waste assumptions to restaurant patrons while ignoring waste in restaurant kitchens. The ideal study would take a comprehensive, “farm to fork” approach with the most consistent boundaries and methodologies possible and would explore why loss occurs as well as the type of food lost.
- **Standardizing measurement methodologies and creating aggregation mechanisms:** Build off the Food Loss and Waste Reporting Protocol to establish a standardized methodology to consistently measure food waste. Also, develop a mechanism to aggregate and disseminate that information as it is gathered by individual businesses, institutions, and governments. Over time, this would build a large data pool and allow participants to benchmark themselves against one another. We need one methodology for the private sector and another for local and state governments. For the latter, targeted funding and protocols to support food waste audits could catalyze more participation.
- **Driving measurement and reporting through example and purchasing policies:** Food wasted by government vendors adds cost to government contracts. Federal agencies should mandate food waste reporting in their own food service operations and in major food procurement contracts. This could help reduce food and disposal costs and standardize the practice of reporting throughout the food service industry.

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Engage and educate the public. Since the largest portion of food is wasted by consumers in households and restaurants, public engagement is critical. Also, increased consumer awareness spurs policy change and enables businesses to more proactively and creatively



tackle food waste. Furthermore, public engagement can empower individuals to effect change through their spheres of influence as, perhaps, event organizers, health professionals, restaurant workers, or teachers. The federal government could conduct behavior-change campaigns, following the models set by the Save the Food campaign and Food: Too Good to Waste. Also, for long-term behavioral change, we should engage children in school classrooms and cafeterias and through farm-to-school and school gardening programs.

Standardize food date labels. More than 80 percent of consumers at least occasionally discard food prematurely due to date label confusion. Businesses, likewise, wind up discarding perfectly wholesome food. Standardized date labels and subsequent consumer education could quickly reduce the amount of food wasted by both households and businesses. In 2016, the USDA recommended that food manufacturers and retailers use “Best if Used By” as the standard date label phrase.³⁸¹ In January 2017, the two largest food industry associations announced voluntary guidelines to limit date labels to “Best if Used By” to describe product quality and “Use By” for highly perishable products or those that may present food safety concerns over time.³⁸² These are moves in the right direction, but more must be done to truly eliminate the confusion. The FDA and USDA should use their authority to establish the industry guidance as a rule, including a requirement that only consumer-facing dates be visible while sale information for the retailer be coded. Products with quality dates should be allowed to be sold and donated after that date, a circumstance that currently varies by state and municipality. Last, the agencies should conduct or support a consumer education campaign about

date labels. These changes would also be possible through federal legislation rather than agency rulemaking.

Evaluate the impact of federal marketing orders and commercial grading standards on fruit and vegetable waste. While commercial, rather than federal, standards prompt much of the waste of cosmetically imperfect produce, the USDA should evaluate whether its marketing orders and grading standards constrain the sale or donation of wholesome but cosmetically imperfect product. The department also should evaluate the impact of commercial standards on fruit and vegetable losses throughout the supply chain and facilitate changes.

Remove barriers to food donation through the following actions:

- **Update the Bill Emerson Good Samaritan Act** to explicitly provide liability protection for donated food that is mislabeled in ways that are irrelevant to food safety and food that is past its quality date. Liability protection should also cover donors who give food directly to individuals and nonprofit organizations that sell at a discounted price. Furthermore, a federal agency should be designated as the authority over the Good Samaritan Act and should draft guidance clarifying key provisions and terminology.³⁸³
- **Further incentivize food donation** through the addition of tax credits (as an optional alternative to tax deductions) for farmers, tax incentives for transporting donated food, deductions for donations to nontraditional food recovery organizations, and deductions for food with labeling errors that are unrelated to safety.

- **Update the Federal Food Donation Act of 2008** by requiring qualifying federal contracts to offer excess food for donation and report on amounts donated.
- **Finalize the Updated Federal Food Safety Guidelines for Food Recovery** approved in April 2016 by the Conference for Food Protection, and incorporate them into the FDA Food Code.

Encourage local and regional efforts to divert food scraps to organics recycling. Directing food scraps to composting, anaerobic digestion, and other organics recycling options produces a number of environmental and economic benefits. To this end, the EPA should develop model legislation and policies for municipalities, as well as technical assistance and funding (e.g., federal grant and loan programs) for organics recycling infrastructure. We should also improve the market for compost products with a national soils policy or strategy that incentivizes practices such as adding compost to soils.

Create a national goal implementation task force. Designate a small set of diverse stakeholders to advance the national goal to cut food waste by 50 percent by 2030. The task force could provide strategic direction for national efforts, monitor progress, support effective public reporting against the goals and benchmarks, raise visibility of the goals, and recommend improvements.

Incorporate food waste in agricultural and food assistance policies. Many of the above food waste reduction strategies could be directed or incentivized as part of the next Farm Bill. Specifically, funding should be expanded for pilots, innovation, and improved infrastructure. Critical research to better understand issues and develop solutions should be directed. Value-add processing capacity should be expanded. And a specific effort to educate consumers and children alike should be pursued.

STATE AND LOCAL GOVERNMENT

Enact partial or full organics disposal bans, with reduced generation and/or recovery goals.

Prohibiting food from going to landfills or incinerators is proving an effective mechanism to ensure that food scraps are recycled (via composting or anaerobic digestion, for instance). This can be done as a full or partial ban or as a diversion goal. These laws would be most effective in addressing food waste if they also include goals related to reducing generation of food waste, such as Oregon's stated goal to reduce the generation of wasted food by 15 percent by 2025 and 40 percent by 2050.³⁸⁴ They are also effective when they incorporate recovery of food, as was done in California, where 20 percent of edible food that is currently discarded will be recovered for human consumption by 2025.³⁸⁵ See Figure 10 for state laws of this kind.

Adopt national goals. Whether independently or through the U.S. Conference of Mayors resolutions, states

and cities can commit to the national goal of reducing food waste by 50 percent by 2030. This amplifies the effect of the national goal while signaling to local businesses and residents that the issue is a priority locally.

Establish baseline level of food waste. In order to best prioritize programs and policies, it's helpful to understand the source of most food waste, how much is edible, and how much could be rerouted to people in need. In late-2017, NRDC will publish a methodology for estimating these baseline levels.

Engage local businesses and community. Businesses, community organizations, and residents are key to reducing food waste. Governments should engage residents through education and public service campaigns, and businesses through recognition programs, technical assistance, and grant programs.

Incentivize produce donations from farms. Each year on farms, many tons of fruits and vegetables go unsold for lack of a market. To encourage this product to be donated, farmers need financial incentives to address the associated costs of harvesting, washing, sorting, storage, packaging, and transportation. Tax credits provide a larger and more effective incentive than deductions, especially among farmers who often don't have large profits to report. Several states have tax incentives that partially cover product value, as shown in Figure 7. Beyond the current incentives even in those states, we also need expanded funding to cover some of the additional harvest and food handling costs, known as "pick and pack out" costs, incurred by donating farms.

Improve capacity and reduce barriers for food donation. To expand and improve food donation, cities and states should expand infrastructure and staffing capacity for food recovery organizations. They should also examine health and safety regulations surrounding food donation to minimize barriers. Food donation can enable jurisdictions to respond to hunger in their communities while meeting their diversion and other environmental goals and should be woven into waste management plans.

Encourage organics recycling. Develop local and regional composting strategies and infrastructure to support home and community composting, on-site organics recycling at businesses and farms, and expansion of commercial organics recycling. Consider revising regulations for composting infrastructure to streamline the process for obtaining a permit, including the permitting of food scraps to be processed at existing facilities that currently compost only yard trimmings. Amend purchasing policies and requirements to increase local and regional use of compost products (e.g., in new construction). State and local governments can also institute minimum recycling goals, weight-based surcharges on disposal facilities, and economic incentive policies like grants or loans to help expand or establish composting facilities.

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BUSINESS

There is good reason for businesses to take aim at the food they are wasting. Though sometimes difficult to measure and therefore to “see,” analyses of businesses that do take action to reduce their food waste demonstrate that it’s worth their while. A 2017 study found that half of the 1,200 business sites analyzed saw more than a 14-fold financial return on investment in food waste reduction efforts. Restaurants tended to have the highest returns, and hotels, food service companies, and food retailers tended to have returns of \$5 to \$10 for every \$1 spent.³⁸⁶

BROAD CHANGES

Conduct regular food waste audits. As the saying goes, what gets measured gets managed. With an eye toward reducing excess food, businesses of all sizes can streamline their operations by auditing their food losses and setting reduction targets. This will establish a baseline against which to evaluate goals and will highlight cost-cutting opportunities. While periodic audits are helpful, daily or weekly measurement ensures that vigilance to reduce waste becomes standard practice. Engaging staff through contests or recognition can create a team effort around food waste reduction.

Set short-term targets. The Consumer Goods Forum set a food waste reduction target of 50 percent by 2025. Fifteen U.S. companies—including Sodexo USA, ConAgra, General Mills, and Ahold USA—have already committed to the national goal of 50 percent reduction by 2030. More companies should join them as part of the U.S. Food Loss and Waste 2030 Champions commitment. Additionally, short-term targets can motivate more specific actions. Companies should set achievable three- and five-year targets, even if they are modest and even if they’re not public. Alternatively, companies could commit to joint short-term targets, like the Courtauld Commitment in the United Kingdom, which enabled the food industry to reduce product and packaging waste by 1.6 million tons from 2009 to 2015.³⁸⁷

Publicly report waste numbers. Just as companies now measure and report their carbon footprint, publicly reporting food waste will help them benchmark and learn from one another while facilitating public dialogue. Implementing the new Food Loss and Waste Protocol could also improve consistency and benchmarking. The FWRA and the British Retail Consortium (BRC) have both published useful joint industry reports, but individual reporting would expand transparency. For instance, Tesco began publicly reporting its food waste by category in 2014 and has continued to do so despite a rise in quantity in 2016.

Focus on reducing meat and dairy waste. Not all wasted food is equal, and meat and dairy have more financial and resource implications than most. If starting with particular categories helps prioritize, choose these two.

Standardize food date labels. Now that the food industry has established guidelines for standardized food date labels, food producers, manufacturers, and retailers should be sure the date labels on their products comply with this guidance.

Adopt best practices and create new ones. The FWRA has put forward two sets of best practice descriptions, including standard operating procedures and methods to overcome barriers to food donations.³⁸⁸ The National Restaurant Association gives guidance on food waste audits, inventory tracking, and other best practices as part of its Conserve program.³⁸⁹ New case studies are emerging regularly as companies try new solutions. Many of these practices save money while also earning goodwill and advancing companies’ greenhouse gas and water footprint goals. In addition, in this time of innovation, there’s opportunity for businesses to try new measures to shift procurement, preparation, service, and merchandising practices. Those that work can help expand the knowledge and practice base of solutions.

Invest in innovative technological solutions. Food and financing companies must foster an atmosphere that supports the piloting, improvement, and large-scale adoption of new food-saving technologies. We already have apps that tell consumers how long products have been in their refrigerator, plan appropriate portions, and create shopping lists. Restaurant kitchens can use waste-tracking software, and some food packages have smart labels with gas- or temperature-sensitive indicators. Solutions are constantly in development to extend product life, reduce shrinkage (losses) during transport, and monitor product freshness. However, this level of innovation needs capital and technical resources to succeed at scale.

SPECIFIC SUPPLY-CHAIN STAGE CHANGES

At Production

Broaden cosmetic standards for fresh fruits and vegetables. Relaxed product specifications related to appearance and product lines featuring cosmetically imperfect produce could potentially reduce on-farm losses while expanding the variety of products on the market.

Expand alternative outlets and secondary markets for lower-grade foods. Some brokers, distributors, and wholesalers already sell lower-grade products. However, further growth and innovation is warranted, from new food products to channels for connecting these foods with underserved populations. A growing cadre of innovative companies is demonstrating the business potential of traditionally undervalued surplus and imperfect fruits and vegetables. Supportive federal policy, technical assistance, and flexible financing can help grow this sector.

Practice farm-level food recovery. Food recovery organizations are eager to receive more fresh produce donations, and gleaning organizations can help harvest unsold crops. Increased funding to help cover farmers' extra harvesting and handling costs and improved capacity to transport donated produce from farms can encourage additional donations. Expanded communication with farmers about the availability of federal tax incentives is also important.

Expand food rescue and recovery infrastructure. A major growth area for the food rescue and recovery community is expanding donations of fresh fruits and vegetables for food-insecure people. Additional resources are needed to fund the associated transportation, storage, processing, distribution, and training costs. Since surplus fresh produce tends to be available in large volumes during narrow time frames during harvest season, expanded capacity to extend the shelf life of donated produce (e.g., through canning or freezing) is essential. Businesses, which benefit from significant tax breaks for donated food, can play a key role in financing such investments. Because they are smaller and tend to have less refrigeration capacity, food pantries face particularly high barriers to handling fresh produce.³⁹⁰

Package produce by the pound. The way fruits and vegetables are sold can also drive produce losses. When produce is packed by numbers of units (e.g., 10 per case), uniform sizes and shapes are favored. Packing by the pound, on the other hand, would require greater flexibility on the part of food service and retail buyers but would likely reduce waste of smaller, larger, or oddly shaped items.

Promote regional or local food distribution. Shorter transport times and distances can reduce losses during distribution. Regionalized markets can also provide a home for produce varieties with shorter shelf lives. Personal relationships, which are often developed as part of local or regional food networks, can help nonstandard product find a market. For instance, a farmer with hail-damaged tomatoes could call a restaurateur to ask if he would still buy them—something that does not occur in more industrial relationships.

Reduce Bycatch and Utilize Lesser Known Species. Highly targeted gear and real-time information sharing that updates fishery limits can help address losses due to bycatch. However, these procedures can be expensive and complex. Another part of the solution is establishing markets for lesser known species that at times make up that bycatch, such as dogfish, monkfish, and skates.

At Processing and Manufacturing

Focus on reengineering. Redesigning products, reengineering equipment and manufacturing processes, and developing new food utilization technologies could improve efficiency in processing. Manufacturers can also develop a streamlined, sanitary way to separate items that are consistently unused and instead sent for donation.

Develop secondary uses for trimmings, peels, and other by-products. Trimmings and peels should be considered for their nutritional value and their potential to be used for other food products whenever possible, such as in soups and smoothies. Similarly, other edible by-products can be developed into ingredients, such as flours.

Optimize product size. Attractively priced large packages often tempt consumers into overbuying. Manufacturers can help consumers avoid waste by offering smaller or customizable amounts. Allowing for smaller portions, by such means as resealable packaging or individual packaging, can reduce food waste at home. However, the trade-offs of additional packaging, such as increased plastic waste, should also be considered.

At Retail: In-Store

Streamline inventory. Stocking fewer items leads each type of item to sell more quickly, reducing both shrinkage and inventory costs. Analyzing item performance can help identify opportunities to eliminate items as well as improve forecasting and inventory management, significantly cutting costs.

Discount older products. Discounting items near the end of their shelf life generates revenue, eliminates need for donation or disposal, and gives customers a bargain.

Redesign product displays. Platforms and other props can make produce bins appear fuller without utilizing as much product and encourages less handling.

Allow prepared foods to run out close to closing. Use signage to explain to consumers that these practices help curtail waste.

Donate more. Retailers should work with local agencies to address the logistical challenges related to food donations. These donations contribute to the community and provide substantial tax deductions. Retailers who donate only nonperishables and bakery items should consider donating meat, dairy, and produce.

At Retail: Beyond the Store

Examine contract terms and aesthetic grading standards. Allowing for occasional flexibility in delivered volumes could significantly reduce the pressure on growers to overplant. Easing cosmetic standards could translate to fewer fruits and vegetables left in the field or culled. In 2008, a U.K. commission investigated grocery supply chains and developed a detailed framework for supplier contracts that addresses aspects of shared risk across the supply chain.³⁹¹ Purchase agreements that share risk with growers—such as purchasing a percentage of the crop rather than a volume of a certain grade product—could lead to much higher utilization of what’s grown.

Adjust promotions. Specials that encourage overbuying, thus passing waste off to the consumer, should be reconsidered. U.K. grocers have been experimenting with alternative promotion schemes that could serve as models for U.S. retailers. For instance, the biggest grocery chains are moving away from “buy one, get one free” and multi-buy promotions on perishable items with the goal of reducing waste among consumers.³⁹²

Educate consumers. The retail environment is an ideal setting in which to educate consumers on food preparation, storage, expiration dates, and safe food handling. Providing more education to customers also improves their shopping experience and loyalty to the retail brand. U.K. grocers ramped up consumer education efforts through information on produce bags, in-store television displays, and online contests.

Optimize package size. Retailers can also help consumers avoid waste by enabling the purchase of smaller or customizable amounts—whether in the form of unpackaged produce, a staffed deli (or similar) counter, or a bulk aisle.

In Restaurants and Other Food Service Contexts

Adapt menus. Reducing menu choices, using specials to flush inventory, repurposing food, and avoiding or redesigning buffets are all best practices for menu planning.

Provide flexible portions. Restaurants can address waste at the table by offering half orders or other flexible portion options, reducing serving sizes (while potentially offering optional refills), requiring customers to opt in for chips and bread baskets, or allowing customers to choose their side dishes.

Use smaller batches and pans. Cooking to order or preparing smaller batches produces less waste. Scaling back production at the end of the day and using smaller serving containers in salad bars or buffets can also reduce the amount of uneaten food.

Encourage guests to take food home. Restaurants should urge diners to take leftovers with them, with as little packaging as possible, made of reusable or recyclable/compostable materials.

Learn about donation benefits. Food donors are protected from liability and receive enhanced tax deductions. Understanding these benefits can encourage donations, which also tends to boost morale among employees who don’t like throwing good food away.

Audit waste and engage staff. Waste audits have been shown to inspire both staff and management to identify opportunities to alter menu items, food preparation habits, purchasing practices, and cooking quantities. While occasional audits can be helpful, integrating daily auditing into standard kitchen practice means that attention to waste will be a continued part of the operation. Involving staff through contests or recognition programs can also be an effective way to reduce wasted food.

Offer low-waste catering. Most catering operations build in significant buffers to ensure that food won’t run out, leading to high levels of waste. Caterers should reexamine their buffers and narrow them if possible. In addition, they should offer clients a lower-waste option, acknowledging the risk that some items may run out.

Minimize food waste in K–12 schools. A wide range of strategies can reduce food waste in schools. These include cutting whole fruit into smaller pieces, providing salad bars, allowing students to choose side dishes, having longer lunch periods (so students can finish their food), and scheduling lunch after recess to prompt better appetites. Also, schools are increasingly using “share tables” that allow children to share untouched food they don’t intend to eat. We can also teach children to value their food more and waste less through home economics or cooking classes, classroom curriculum, educational materials in cafeterias, farm-to-school programs, school gardens, and composting programs.

CONSUMERS

As the largest collective source of wasted food, consumers can make a big difference in their own kitchens and by educating friends, family, colleagues, and others. Some tips are provided below; more information can be found at www.savethefood.com and in the *Waste-Free Kitchen Handbook*.³⁹³

Shop wisely. Consumers can reduce their food waste potential by planning meals, using shopping lists, and buying customized portions of loose produce and bulk bin items. Consumers should also avoid impulse purchases or marketing tricks that encourage overbuying. Though large-volume purchases and promotions may be cheaper per ounce, it may actually be more expensive in the long run if the full purchase is not eaten. A 2015 study from the University of Arizona concluded that Americans pay close attention to sale prices, but not the money squandered through wasted food.³⁹⁴

Understand date labels. Sell-by, use-by, and best-by dates are manufacturer suggestions for peak freshness or quality and are not indicative of safety. Aside from



infant formula, date labels are not federally regulated. Most foods can be safely consumed after these dates have passed. Consumers should be educated about these labels and how to rely more on their own judgment about food quality.

Buy and serve smaller portions, and save leftovers. Resources such as online portion calculators can help consumers prepare appropriate amounts of food. Uneaten meals can be saved as leftovers in the refrigerator or freezer. Consumers can also ask for smaller or half portions at restaurants and supermarkets, and take leftovers home from restaurants and eat them later.

Use your freezer. Food lasts much longer when frozen. Almost anything can be frozen, including milk, cheese, and eggs. Buying frozen produce can help ensure you'll always have vegetables on hand. Frozen foods often have as much nutrition as fresh products. In fact, sometimes they have even more because they are frozen within just hours of being harvested.³⁹⁵

Declutter. It's hard to use food when you can't see it. Keeping shelves tidy, storing food in clear containers, and placing newly purchased food to the rear of the shelf in order to push older items to the front will reduce waste. These rules apply to the refrigerator, freezer, and even the cupboard.

Keep it local. Whether it's growing your own, buying from a farm stand or farmer's market, or joining a community-supported agriculture program, connecting with the creation of your food makes you more likely to value it because you know just how much went into getting it to your fridge.

Share food. Sharing with friends and family not only avoids waste but builds community. This might mean sharing excess entrées, splitting a farm box, or even donating a glut of garden-grown produce.

Support stores and restaurants that avoid waste. Patronize stores and restaurants that make an effort to reduce their waste by embracing practices like flexible portions and allowing items to run out at the end of the day.

Buy imperfect products. Just like retailers, consumers can reduce farm-level losses by purchasing fruits and vegetables with varying sizes, shapes, or colors. Encourage stores to sell imperfect produce, oddly shaped baked goods, items with damaged packaging, and so on.

Send food scraps to backyard chickens and compost. For inedible parts and other food scraps, backyard chickens make excellent food recyclers. For those who are not ready for additional animals, recycle your inedible food by composting through a community compost program or using a home compost bin.

Fight wasted food everywhere! Convert friends and family through words and deeds. Get involved with food recovery organizations and community events, and donate garden surpluses. Encourage retailers and restaurants to avoid excessive portion and package sizes and to donate foods they can't sell. And, to curb the problem for future generations, teach kids to value their food and not to waste it.