



A National Strategy to Reduce Food Waste at the Consumer Level

Despite food's essential role as a source of nutrients and energy and its emotional and cultural importance, U.S. consumers waste an estimated average of one pound of food per person per day at home and in venues where they buy and consume food. Many factors contribute to consumers' role in this waste—their behaviors are shaped not only by individual and interpersonal factors but also by influences within the food system, such as policies, food marketing, and the media.

The consequences of food waste in the United States and around the world are severe. The wasting of food depletes natural resources, degrades the environment, and is costly to consumers. In addition, at a time when the COVID-19 pandemic has severely strained the U.S. economy and sharply increased food insecurity, it is predicted that consumer food waste will worsen in the short term because of both supply chain disruptions and the closures of food businesses that affect the way people eat and the types of food they can afford.



To build understanding of how to reduce consumer food waste, the Walmart Foundation and the Foundation for Food and Agriculture Research¹ provided funding to the National Academies of Sciences, Engineering, and Medicine to conduct a consensus study of ways to reduce U.S. food waste at the consumer level. To address this question, a committee of experts was appointed with expertise in behavioral economics, social psychology, marketing and delivery models, nutrition, food systems research, food industry product development, public health, environmental science and implementation science. The committee was charged with reviewing pertinent research from the social and behavioral sciences; identifying strategies for changing consumer behavior; taking into account interactions and feedbacks within the food system; and developing a strategy for addressing the challenge of reducing food waste at the consumer level from a holistic, systems perspective.

The committee's report, *A National Strategy to Reduce Food Waste at the Consumer Level (2020)*, identifies the key factors that drive behavior related to consumer food waste, discusses promising intervention strategies to support consumers in wasting less, and outlines a national strategy to use research to build on existing efforts to reduce consumer level food waste.

¹The Walmart Foundation and the Foundation for Food and Agriculture Research made a presentation to the committee at its first meeting about the study charge and their perspectives on the need for the study. They had no other discussions with the committee throughout the study process.

DRIVERS OF CONSUMER BEHAVIOR

Food acquisition, consumption, storage, and disposal are complex consumer behaviors. They depend on context and are driven by multiple factors at the individual and societal levels within and outside the food system that interact to produce food waste. Researchers who have studied consumer behavior in other contexts have shown that consumers are most likely to act in a particular way when they not only are motivated to do so but also have the ability and opportunity to act on that motivation.² The committee applied this Motivation-Opportunity-Ability framework in analyzing how individual-level factors and the actions of others, such as retailers, other food providers, and policy makers interact to affect how consumers acquire, consume, store, and dispose of food.

The committee identified categories of influences that drive consumer behavior and offer promising targets for interventions to reduce food waste:

- consumers' knowledge, skills, and tools;
- consumers' capacity to assess risks associated with food waste;
- consumers' goals with respect to food and nutrition;
- consumers' recognition and monitoring of their food waste;
- consumers' psychological distance from food production and disposal;
- heterogeneity of consumers' food preferences and diets;
- the convenience or inconvenience of reducing food waste as part of daily activities;
- marketing practices and tactics that shape consumers' food behaviors;
- psychosocial and identity-related norms related to food consumption and waste;
- factors in the built environment (including in household and retail environments) and the food supply chain; and
- policies and regulations at all levels of government.

INTERVENTIONS TO ALTER CONSUMER BEHAVIOR

Several categories of these types of interventions hold promise to reducing consumer food waste by consumers. These include appealing to people's values, providing financial incentives, and advising them about ways to reduce food waste. Specific strategies for applying these ideas, for example, are offering smaller plates or removing trays in buffet settings to reduce portions, or providing information about the environmental harms and costs of food waste.

Although the evidence is emerging, understanding of the drivers of consumer behavior, including the underlying cognitive processes, can be applied in the design and implementation of interventions to change food waste behaviors that are tailored to the context and population being targeted.

A NATIONAL STRATEGY

The committee proposed a strategy to use the emerging evidence about drivers and interventions to build on the efforts of the many stakeholders already engaged in efforts to reduce consumer food waste, including the federal Winning on Reducing Food Waste Initiative,³ a national initiative of the USDA, EPA, and FDA. The committee identified three primary pathways for reducing food waste, as well as the responsibilities of the multiple partners who will be needed as part of a coordinated effort to pursue those pathways.

²MacInnis, D. J. and B. J. Jaworski. 1989. Information processing from advertisements: Toward an integrative framework. *Journal of Marketing* 53:1-23.

³The Winning on Reducing Food Waste Initiative is a collaboration of the U.S. Department of Agriculture, the U.S. Environmental Protection Agency, and the U.S. Food and Drug Administration launched in 2018 to help achieve long-term reductions in food loss and wasted food in the United States.

THREE PATHWAYS FOR REDUCING CONSUMER FOOD WASTE

Pathway 1: Change the U.S. food environment to discourage waste by consumers

- **Implement change and innovation in the food industry.** Examples include marketing practices intended to reduce the acquisition of food that is unlikely to be consumed.
- **Include food waste reduction in industry certification.** Third-party organizations, governments, and businesses can include consumer level food waste reduction practices as criteria for environmental performance standards.
- **Harmonize date labeling.** Federal legislation can clarify language and standards for date labels on packaged food.
- **Implement state and local policies encouraging behaviors that prevent food waste.** Examples include fees for the removal of municipal solid waste per unit of waste.

Pathway 2: Strengthen consumers' motivation, opportunity, and ability to reduce food waste

- **Conduct a national behavior change campaign.** This campaign should be designed to address nonconscious drivers of food waste, as well as consumers' ability and opportunity to change wasteful behavior while also informing the public about the environmental, economic, and social benefits of reducing food waste and tools and strategies for reducing their own waste.
- **Spread and amplify messages about food waste through influencers.** Dietitians, state extension specialists, recipe providers, cooking show hosts, chefs, and social media personalities can use their platforms to advance consistent food literacy information, provide evidence-based guidance about optimizing the consumption of food and minimizing waste, and help shift social norms related to food waste.
- **Include instruction and experiential learning about food literacy in education curricula.** Nongovernment organizations, state departments of education, USDA's Food and Nutrition Service, foundations, and others can support K-12, postsecondary, and secondary institutions by providing appropriate tools and resources to promote learning about the social, environmental, and economic impacts of food waste and ways to reduce it.

Pathway 3: Leverage and apply research findings and technology to support consumers in food waste reduction.

Some of the important drivers of food waste at the consumer level, such as unpredictable and busy lifestyles; lack of time, energy, and the cognitive demands of everyday life; and consumers' limited ability to assess food safety, can be addressed with technological developments. Developments in packaging and processing to extend shelf life, refrigeration approaches, and food preservation technology, for example, can play a role in reducing food waste. Food and food storage manufacturers, food retailers, food service providers, and innovators can contribute significantly to reductions in food waste by continuing to improve existing technologies and creating new ones, such as apps to monitor consumer food waste.

COORDINATION AND PARTNERSHIP

The committee's proposed strategy is to create and sustain a broad societal commitment to reducing food waste at the consumer level. It is only through multistakeholder coordination that the United States can make the transition from a society in which attitudes and habits facilitate the wasting of food to one in which attitudes and habits are consistent with appreciating the value of food and its utilization.

Achieving this goal will require the participation of government entities at the federal, state, and local levels as well as the food industry and retailers; influencers and the media; nongovernmental organizations; and those who provide food through a number of different channels, such as cafeterias in schools and universities. Leadership and financial support from the federal level will be necessary to stimulate and coordinate the efforts of multiple stakeholders.

The committee recommends that USDA, EPA, and FDA expand the Winning on Reducing Food Waste Initiative by coordinating with key stakeholders at multiple levels and across societal sectors, including state and local

governments, nonprofit organizations, foundations, industry leaders, food producers, and others, in efforts to reduce food waste at the consumer level.

RESEARCH TO SUPPORT INTERVENTIONS AND THEIR IMPLEMENTATION

Ongoing research will be needed to support the progress of reducing food waste at the consumer level. It will be valuable to expand the understanding of consumer behavior and to expand the focus of research beyond the individual consumer. For example, researchers have not yet fully explored drivers of behavior that operate across contexts outside the household or how behaviors and attitudes related to food waste translate across contexts such as home, restaurants, and work. The committee also believes that more studies of interventions, drivers, and the interplay among drivers are needed, as are modeling and qualitative studies and study of food waste among diverse population groups, particularly low-income communities, and contexts.

The committee also highlighted the importance of careful implementation of the interventions they identified as promising. This requires attention not only to unexpected outcomes but also to such factors as feasibility, capacity, fidelity to the intervention design, cost, and appropriateness to the settings in which the intervention will be implemented. Many of the food waste interventions that have been studied have demonstrated efficacy in experimental settings. However, few of these promising interventions have been evaluated systematically for effectiveness in real-world and large-scale applications. Translational research is needed to apply frameworks, methods, and evidence from other contexts to food waste initiatives. Research that integrates intervention development with implementation research is needed to identify and refine the most promising approaches so they can be put into practice at broad enough scale to have meaningful effects.

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For More Information . . . This Consensus Study Report Highlights was prepared by the Board on Environmental Change and Society, in collaboration with the Food and Nutrition Board, based on the Consensus Study Report, *A National Strategy to Reduce Food Waste at the Consumer Level* (2020). The study was sponsored by The Walmart Foundation and the Foundation for Food and Agriculture Research. Support for the work of the Board on Environmental Change and Society is provided primarily by a grant from the National Science Foundation. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project. Copies of the Consensus Study Report are available from the National Academies Press, (800) 624-6242; <https://nationalacademies.org/Food-Waste>.

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