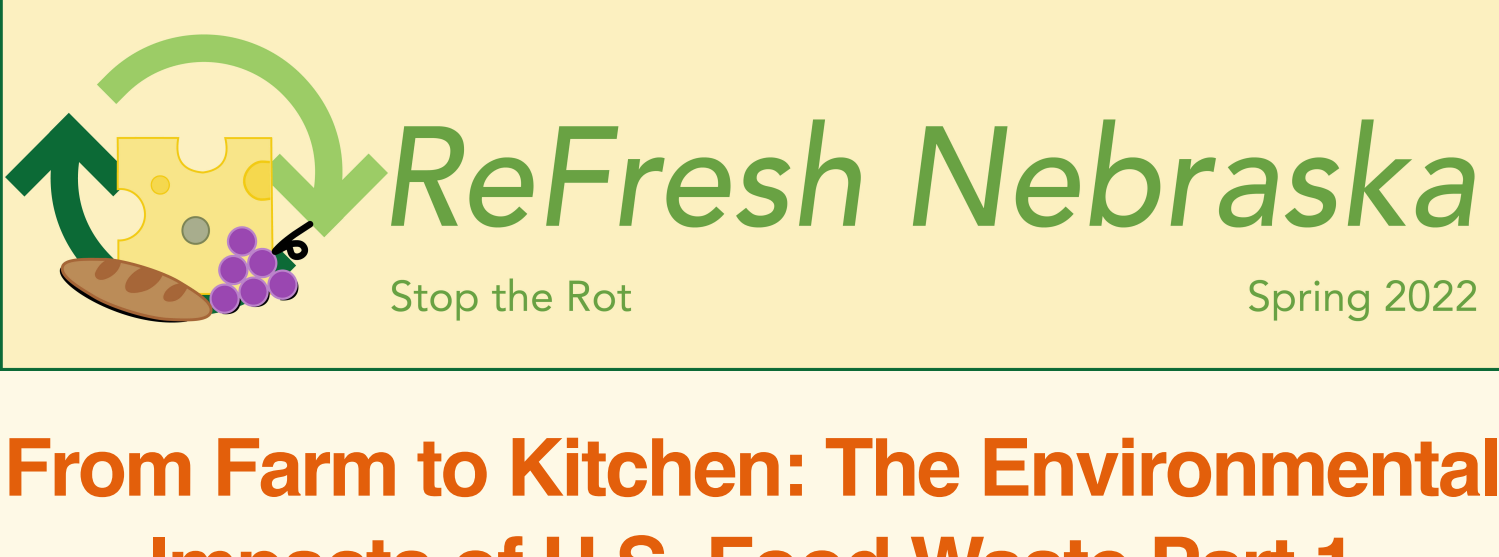




From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste Part 1

Following is the Executive Summary of an EPA report issued in November of last year entitled: Part 1 From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste. If you would like to see the report in its entirety, please click [here](#).

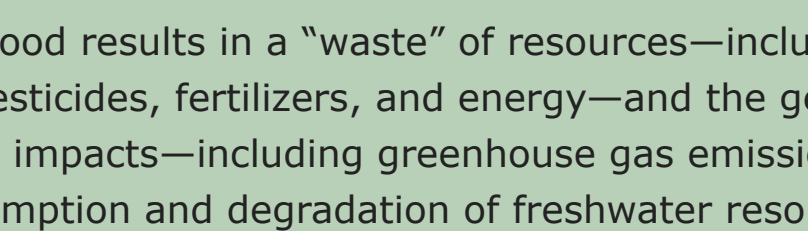
Over one-third of the food produced in the United States is never eaten, wasting the resources used to produce it and creating a myriad of environmental impacts. Food waste is the single most common material landfilled and incinerated in the United States, comprising 24 and 22 percent of landfilled and combusted municipal solid waste, respectively. This wasted food presents opportunities to increase food security, foster productivity and economic efficiency, promote resource and energy conservation, and address climate change.

As the United States strives to meet the Paris Agreement targets to limit the increase in global temperature to 1.5 degrees above pre-industrial levels, changes to the food system are essential. Even if fossil fuel emissions were halted, current trends in the food system would prevent the achievement of this goal. Globally, food loss and waste represent 8 percent of anthropogenic greenhouse gas emissions (4.4 gigatons CO₂e annually), offering an opportunity for meaningful reductions.

Reducing food waste can also help feed the world's growing population more sustainably. The United Nations (UN) predicts that the world population will reach 9.3 billion by 2050. This population increase will require a more than 50 percent increase in food production from 2010 levels. Decreasing food waste can lessen the need for new food production, shrinking projected deforestation, biodiversity loss, greenhouse gas emissions, water pollution, and water scarcity.

In 2015, the United States announced a goal to halve U.S. food loss and waste by 2030, but the nation has not yet made significant progress. The U.S. Environmental Protection Agency (EPA) prepared this report to inform domestic policymakers, researchers, and the public about (1) the environmental footprint of food loss and waste (FLW) in the U.S. and (2) the environmental benefits that can be achieved by reducing U.S. FLW. The report examines the farm-to-kitchen (cradle-to-consumer) impacts of FLW, excluding the impacts of managing FLW (e.g., methane emissions from landfills), which will be covered in a separate companion report (The Environmental Impacts of U.S. Food Waste: Part 2).

Given the size and dynamic complexity of the U.S. food system, no single agreed-upon comprehensive estimate of the total amount of U.S. FLW exists. Instead, the literature includes multiple credible estimates, which differ in scope and methodology, that together provide insights into the magnitude and distribution of U.S. FLW. Estimates that include food lost or wasted during all stages of the food supply chain (from primary production to consumption) range from 73 to 152 million metric tons (161 to 335 billion pounds) per year, or 223 to 468 kg (492 to 1,032 pounds) per person per year, equal to approximately 35 percent of the U.S. food supply. Roughly half of this food is wasted during the consumption stage (households and food service), and fruits and vegetables and dairy and eggs are the most frequently wasted foods.



This uneaten food results in a "waste" of resources—including agricultural land, water, pesticides, fertilizers, and energy—and the generation of environmental impacts—including greenhouse gas emissions and climate change, consumption and degradation of freshwater resources, loss of biodiversity and ecosystem services, and degradation of soil quality and air quality. Each year, U.S. FLW embodies:

- 560,000 km² (140 million acres) agricultural land – an area the size of California and New York combined;
- 22 trillion L (5.9 trillion gallons) blue water – equal to annual water use of 50 million American homes;
- 350 million kg (778 million pounds) pesticides;
- 6,350 million kg (14 billion pounds) fertilizer – enough to grow all the plant-based foods produced each year in the United States for domestic consumption;
- 2,400 million GJ (664 billion kWh) energy – enough to power more than 50 million U.S. homes for a year; and
- 170 million MTCO₂e GHG emissions (excluding landfill emissions) – equal to the annual CO₂ emissions of 42 coal-fired power plants.

This uneaten food also contains enough calories to feed more than 150 million people each year, far more than the 35 million estimated food insecure Americans. To estimate the environmental impact of FLW, researchers consider the amount of food lost or wasted as well as the type of food lost or wasted and supply chain stage at which it was lost or wasted. Food wasted further along the supply chain carries more impacts than food lost or wasted earlier, since the impacts are cumulative. For example, food lost during primary production embodies the resources used to grow the food, whereas food wasted during the consumption stage embodies the resources used to grow, process, package, store, and distribute the food up to the point the food reaches the consumer.

Given the substantial environmental impacts of FLW, halving FLW – as the U.S. aims to do – could meaningfully reduce the resource use and environmental impacts of the U.S. food system. Researchers estimate that halving U.S. FLW could reduce the environmental footprint of the current cradle-to-consumer food supply chain by:

- More than 300,000 square km² (75 million acres) agricultural land – an area greater than Arizona;
- 12 trillion L (3.2 trillion gallons) blue water – equal to the annual water use of 29 million American homes;
- Nearly 290,000 metric tons (640 million pounds) of bioavailable nitrogen from agricultural fertilizer with the potential to reach a body of water, cause algal blooms and deteriorate water quality;
- 940 million GJ (262 billion kWh) energy – enough to power 21.5 million U.S. homes for a year; and
- 92 million MTCO₂e GHG – equal to the annual CO₂ emissions from 23 coal-fired power plants.

Note that these estimates are conservative in comparison with other published studies presented in this report, and that these savings can only be achieved through prevention (i.e., source reduction) of FLW. Recycling of food waste cannot achieve these benefits since a substantial fraction of the impacts occur during the primary production of food.

Modeling in the scientific literature also offer insights into how to maximize the environmental benefits of FLW reduction programs and policies, which the report summarizes into three key points:

1. The greatest environmental benefits can be achieved through prevention rather than recycling.
2. The largest energy and greenhouse gas emissions benefits can be obtained by reducing FLW from households and restaurants.
3. Focusing on reducing FLW of the most resource-intensive foods, such as animal products and fruits and vegetables, can yield the greatest environmental benefits.

The report also examines U.S. FLW in global context to evaluate the U.S. contribution to this global issue and to highlight key similarities and differences among regions and countries. Currently the United States wastes more food and more food per person than most any other country in the world. Also, the environmental impact of each unit of U.S. food loss and waste is greater than that of most other countries, as the U.S. wastes more food downstream and more animal products than the global average. Fortunately, positive examples of progress are emerging in similar countries. Over the last decade, countries such as the United Kingdom and Japan have substantially reduced food waste, contributing to the global effort under the UN Sustainable Development Goals.

As global populations and incomes rise, and the environment faces pressures from increased food production, reductions in the per person environmental footprint of agriculture will be essential to the sustainability of the planet. Limited options are available to sustainably increase the global food supply to meet growing demand. Closing yield gaps and increasing productivity alone will likely be insufficient to prevent further deforestation and environmental degradation. Even under the most promising scenarios of yield increases, up to 20 percent more land will be needed by 2050. Thus demand-side measures, such as reducing FLW or dietary shifts, will also be needed to sustainably increase the food supply. A recent study projects halving global FLW could result in a 24 percent reduction in cumulative global food system greenhouse gas emissions between 2020 and 2100 (331 Gt CO₂e), compared to a business-as-usual scenario. Significant reductions (6 to 16 percent) could also be achieved in the amounts of agricultural land, water, and fertilizer used in 2050 (compared to business-as-usual scenario) by halving global food loss and waste.

Key research needed to help the United States meet its goal to halve food loss and waste includes:

- Enhancing the data on U.S. FLW by improving precision and addressing data gaps.
- Increasing frequency at which the United States can track progress in reducing FLW.
- Quantifying the environmental impacts associated with U.S. waste of imported foods.
- Strengthening understanding of the interaction among food system supply chain stages with regard to FLW.
- Evaluating the life cycle impacts of proposed FLW prevention strategies.
- Exploring how trends in the U.S. food system will affect FLW and its environmental footprint in the future.
- Deepening our understanding of drivers of FLW unique to the United States.

ReFresh Recipes

Shopping your fridge first is an important strategy for reducing food waste. Here's a recipe idea that will help you use what you have before buying more!

APPLE COOKIES

STEP ASIDE, CHOCOLATE CHIPS. THERE'S A NEW COOKIE IN TOWN

Ever heard of apple cookies? Well, all your friends are about to. Because in addition to being a great way to use up aging apples, James Beard's Apple Cookies are a sweet twist on a classic recipe that, once you try for yourself, you won't be able to stop sharing with your friends.

USES UP Apples

MAKES 4 Dozen Cookies

INGREDIENTS

- ½ cup butter
- 1½ cups firmly packed brown sugar
- 1 egg
- 2½ cups sifted all-purpose flour
- 1 teaspoon cinnamon
- ½ teaspoon salt
- ½ teaspoon baking soda
- ½ teaspoon nutmeg
- ½ teaspoon allspice
- ½ teaspoon cloves
- ½ cup apple juice (pineapple juice, orange juice, or milk can be substituted)
- 1 cup chopped, unpeeled raw apple
- 1 cup chopped walnuts, hazelnuts, or pecans
- 1 cup raisins

DIRECTIONS

Preheat oven to 375°F. In a large mixing bowl, cream the butter, then cream in the sugar. Beat in the egg.

In a separate mixing bowl, sift the dry ingredients together, then add to the creamed mixture, then add the juice and mix. Stir in the apple, nuts, and raisins.

Using two spoons (rather than your hands), scoop up a small amount of dough with one spoon and push it onto a buttered cookie sheet with the other spoon, leaving about one and a half inches between each cookie.

Bake for about 10 to 12 minutes, or until light brown. Transfer to a rack and let cool. Store in airtight containers.

CREDIT: James Beard Recipe courtesy of the [James Beard Foundation](#).

FOOD STORAGE TIPS FROM SAvE THE FOOD.COM

MEAT, POULTRY & SEAFOOD

BACON

REFRIGERATE IT: Yes

AT FRESHEST: Fresh, 7 days; dry-cured, 4 to 6 days; cooked, 4 to 5 days; frozen, up to 3 months

OPTIMAL STORAGE: Original packaging or inside a zip-top plastic bag with air removed.

FREEZING: Unopened—Ovenwrap store package with heavy-duty foil. Opened—Layer slices between wax or parchment paper, and then wrap tightly a few times with the paper; store in a sealed zip-top freezer bag.

USE IT UP/REVIVAL: Bacon s'mores, bacon cookies, bacon bits, bacon-wrapped vegetables, bacon cupcakes.

Store bacon grease in a covered container in the refrigerator and, when the mood strikes, use it in cooking. Try rubbing bacon fat onto cleaned russet potatoes before baking; meanwhile, sauté some red onions in bacon fat, then top the potatoes with the onions and crumble on some cooked bacon if you've got it.

CANNED FISH

REFRIGERATE IT: Once opened

AT FRESHEST: Unopened, 3 years; opened, 3 to 4 days; frozen, up to 2 months

OPTIMAL STORAGE: Unopened—Cool, dry place. Opened—Covered in an airtight container (not the original can) in the refrigerator.

FREEZING: Remove from the can and place in an airtight container or zip-top freezer bag.

USE IT UP/REVIVAL: Feed small amounts to your dog or cat. Discard cans that are dented, leaking, bulging, or rusted. Make a tuna melt or a tuna casserole.

CANNED MEAT

REFRIGERATE IT: Once opened (unless label says to store refrigerated)

AT FRESHEST: Unopened, 2 years; opened, 3 to 4 days; frozen, 1 to 2 months

OPTIMAL STORAGE: Unopened—Cool, dry place.

Opened—Covered in an airtight container (not the original can) in the refrigerator.

FREEZING: Remove from the can and place in an airtight container or zip-top freezer bag.

USE IT UP/REVIVAL: Discard cans that are dented, leaking, bulging, or rusted.

Make a "Spamburger" with pineapple, add some Spam to your macaroni and cheese, make some Spam and kimchi fried rice . . .

Download the entire Food Storage Guide, go to: [www.savethefood.com/food-storage](#)

Quick Tricks! Brought To You By: Institute of Agriculture and Natural Resources NEBRASKA EXTENSION

QUICK TRICKS

How to Store and Prepare Fresh Fruits and Vegetables to Prevent Food Waste

Alice Henneman, MS, RDN Extension Educator

About 90 billion pounds of edible food goes uneaten each year in the United States, costing consumers about \$370 per person yearly. Tossed fruits (\$45) and vegetables (\$60) account for about 30% of this amount. Proper storage and preparation of fresh produce can help save money and better utilize the resources that go into producing food (land, water, energy).

Following are some methods for prolonging the life of fresh produce.

Wash Produce Thoroughly

Wash produce before you use it. NOT when you bring it home! Wash hands before working with produce. Fresh produce has a natural protective coating that helps keep in moisture and freshness. Washing produce before storage causes it to spoil faster. Remember those berries that turned moldy after you washed and then stored them?

Remove and discard under leaves. Rinse under clean, running water just before preparing or eating. Don't use soap or detergent as it can get into produce and make you sick. Rub briskly — scrubbing with a clean brush or hands — to clean the surface. Dry with a clean cloth or paper towel. Cut away bruised and damaged areas.

Rinse fruits and vegetables melons, even if they have a peel, which will be removed (such as melons and citrus fruit). Bacteria on the outside of produce can be transferred to the inside when they are cut or peeled.

For more waste reducing tips, go to: [www.food.unl.edu/cook-it-quick-documents/makeover-your-leftovers.pdf](#)

HOUSEHOLD FOOD WASTE

Some estimates say Americans throw out 25% of the food they buy. Here's the share of each commodity that ends up in consumers' trash.

33% FISH AND SEAFOOD

23% ROOTING TURNIPS

28% FRUITS AND VEGETABLES

27% CEREAL

15% MILK

11% MEAT

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KEEP AMERICA BEAUTIFUL AFFILIATE

WE ARE MOVING!

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