



A Roadmap to Solve Food Waste

Presented by Nate Clark

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WHO WE ARE

ReFED is a national nonprofit working to catalyze the food system toward evidence-based action to stop wasting food.

OUR VISION

A sustainable, resilient, and inclusive food system that optimizes environmental resources, minimizes climate impacts, and makes the best use of the food we grow.



DATA & INSIGHTS

Leveraging data and insights to highlight supply chain inefficiencies and economic opportunities



CAPITAL & INNOVATION

Catalyzing capital to spur innovation and scale high-impact initiatives



BUSINESS INITIATIVES

Enabling waste generator adoption of viable solutions through measurement, advisory, and internal capacity building



COLLECTIVE ACTION

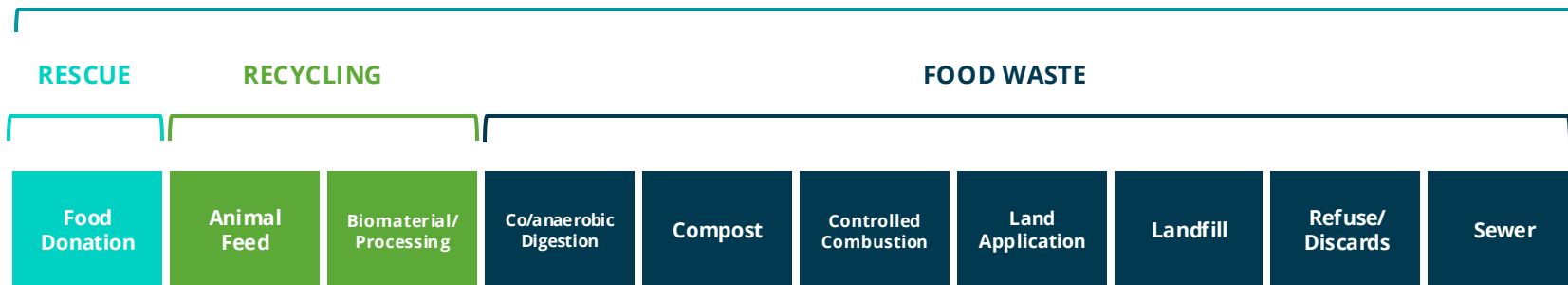
Mobilizing and connecting stakeholders to learn, share, and collaborate on targeted action

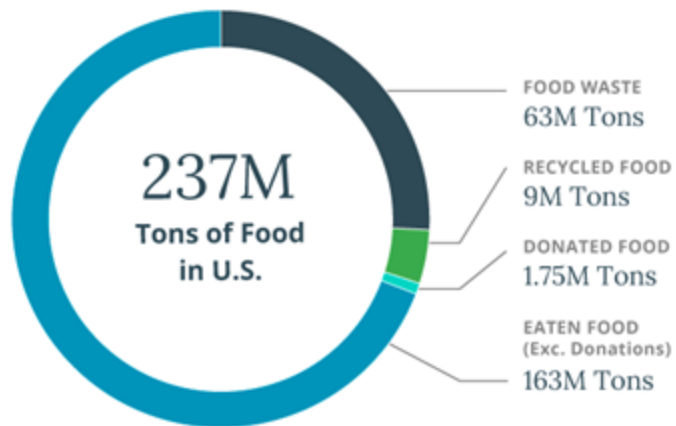
The Food Waste Challenge

What is “Surplus Food?”

All food that goes *unsold* or *unused* by a business or that goes *uneaten* at home—including food and inedible parts (e.g., peels, pits, bones) that are fed to animals, repurposed to produce other products, composted, or anaerobically digested. It also includes food that is *donated*.

SURPLUS FOOD



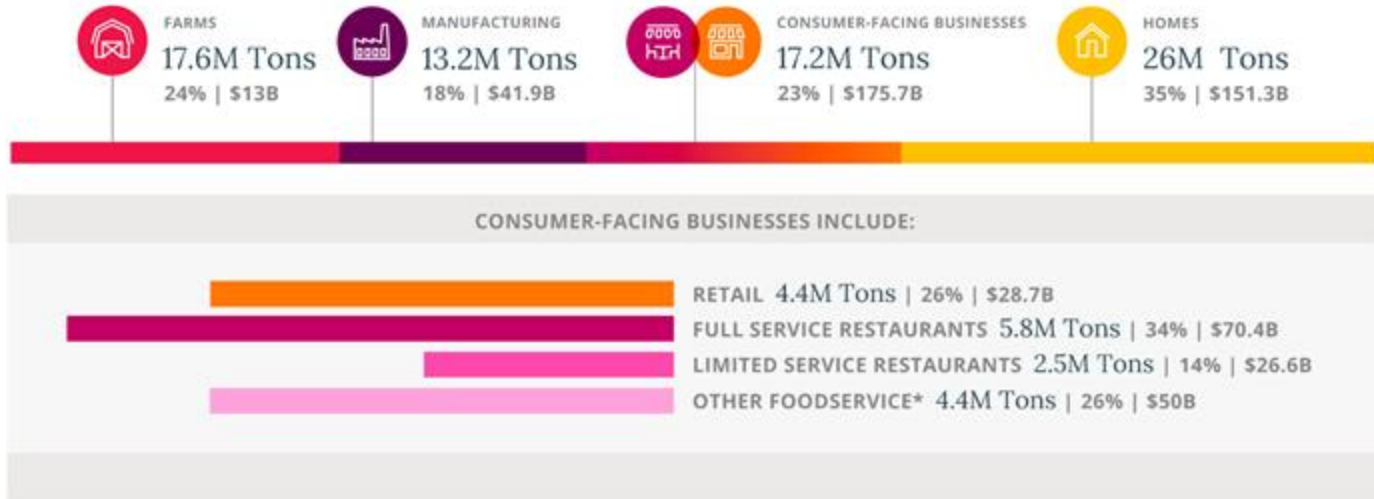


Source: ReFED/2023 Data (Published Feb 2025)

31% of all food
went unsold or
uneaten in 2023.

WHERE DOES SURPLUS OCCUR:

Majority of Surplus Food Comes from Homes



Source: ReFED/2023 Data (Published Feb 2025)

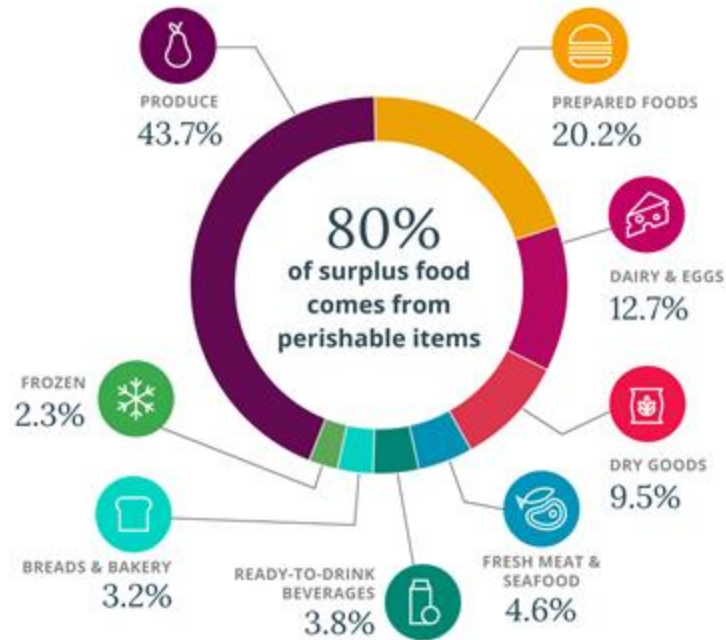
\$782

Annual amount spent per person
on food that is never eaten



WHERE DOES SURPLUS OCCUR:

Fruit and Vegetables Constitute a Third of Surplus



Source: ReFED/2023 Data (Published Feb 2025)

IMPACTS OF UNEATEN FOOD: Environmental

Equivalent to driving
54 million cars
over the year



4%
of U.S. GHG
Emissions



16%
of U.S.
Freshwater Use

As much water as
7 showers each day for
everyone in the U.S

An area the size of
**California and
New York** combined
(EPA)



16%
of U.S.
Cropland Use
(EPA Estimate)



24%
of Landfill Inputs
(EPA Estimate)

#1 input to landfills

Source: ReFED/2023 Data (Published Feb 2025)

Barriers to Addressing Food Waste

- Misalignment of costs and benefits
- Low cost of food and disposal
- Disaggregated supply and demand information and data gaps
- Competing cultural priorities and expectations
- Organizational silos
- Low priority and capacity within food industry to monitor and make change



Food Loss & Waste Solutions



PREVENT



RESCUE



RECYCLE

Action Areas



OPTIMIZE THE HARVEST

Avoid over-production, then harvest as much as possible. For wild caught products, source only what is needed.



ENHANCE PRODUCT DISTRIBUTION

Leverage technology to create smart systems that help efficiently move products to maximize freshness and selling time.



REFINE PRODUCT MANAGEMENT

Align purchases with sales as closely as possible and find secondary outlets for surplus. Build out systems and processes for optimal on-site handling.



MAXIMIZE PRODUCT UTILIZATION

Design facilities, operations, and menus to use as much of each product as possible. Upcycle surplus and byproducts into food products.



RESHAPE CONSUMER ENVIRONMENTS

Drive consumers towards better food management and less waste by creating shopping, cooking, and eating environments that promote those behaviors. Shift culture to place more value on food and reduce waste.



STRENGTHEN FOOD RESCUE

Further the rescue of high-quality, nutritious food by increasing capacity, addressing bottlenecks, and improving communication flow.



RECYCLE ANYTHING REMAINING

Find the highest and best use for any remaining food or food scraps in order to capture nutrients, energy, or other residual value.

Modeled Solutions

Unmodeled Solutions

Best Practices



OPTIMIZE THE HARVEST

Buyer Spec Expansion

Gleaning

Imperfect & Surplus Produce Channels

Partial Order Acceptance

Field Cooling Units

In-Field Sanitation Monitoring

Innovative Grower Contracts

Labor Matching

Smaller Harvest Lots

Improved Communication for Planting Schedules

Sanitation Practices & Monitoring

Optimized Harvesting Schedules

On-Farm / Near-Farm Processing

Local Food Systems

Clear Product Ownership



ENHANCE PRODUCT DISTRIBUTION

Decreased Transit Time

First Expired First Out

Intelligent Routing

Temperature Monitoring (Pallet Transport)

Reduced Warehouse Handling

Advanced Shipment Notifications

Early Spoilage Detection (Hyperspectral Imaging)

Inventory Traceability

Modified Atmosphere Packaging System

Vibration & Drops Tracking

Optimized Truck Packing, Loading & Unloading (e.g., Cross-Docking)

Enforcing Cold Chain SOPs

Regular Maintenance on Refrigerated Trucks

Cross-Docking



REFINE PRODUCT MANAGEMENT

Assisted Distressed Sales

Decreased Minimum Order Quantity

Dynamic Pricing

Enhanced Demand Planning

Increased Delivery Frequency

Markdown Alert Applications

Minimized On-Hand Inventory

Temperature Monitoring (Foodservice)

Waste Tracking (Foodservice)

Low Waste Event Contracts

Direct to Consumer Channels

Online Marketplace Platform

Online, Advanced Grocery Sales

Precision Event Attendance

Repackaging Partially Damaged Products

Retail Automated Order Fulfillment

SKU Rationalization

Markdowns

Optimal Storage

Reduced Displays

Optimized Walk-In Layouts



MAXIMIZE PRODUCT UTILIZATION

Active & Intelligent Packaging

Manufacturing Byproduct Utilization (Upcycling)

Manufacturing Line Optimization

Edible Coatings

Improved Recipe Planning

In-House Repurposing

Precision Food Safety

Discount Meal Plates

Employee Meals

Larger Quantities for Take Home

Small and Versatile Menus

Sous-Vide Cooking



RESHAPE CONSUMER ENVIRONMENTS

Meal Kits

Buffet Signage

Consumer Education Campaigns

K-12 Lunch Improvements

Package Design

Portion Sizes

Small Plates

Standardized Date Labels

K-12 Education Campaigns

Trayless

Home Shelf-life Extension Technologies

Smart Home Devices

Waste Conscious Promotions

Frozen Value-Added Processing of Fresh Produce

Customizable Menus/Options

To-Go Offerings

Free Items Offered Upon Request (e.g., bread, chips)

Storytelling (e.g., product impact, source, upcycled ingredient components)



STRENGTHEN FOOD RESCUE

Donation Coordination & Matching

Donation Education

Donation Storage Handling & Capacity

Donation Transportation

Donation Value-Added Processing

Blast Chilling to Enable Donations

Donation Reverse Logistics

High-Frequency Reliable Pickups

Established Relationships with Businesses

Culling SOPs



RECYCLE ANYTHING REMAINING

Centralized Anaerobic Digestion

Community Composting

Centralized Composting

Co-digestion at Wastewater Treatment Plants

Home Composting

Livestock Feed

Waste-Derived Agricultural Inputs

Insect Farming

Rendering

Waste-Derived Processed Animal Feed

Waste-Derived Bioplastics

Waste-Derived Biomaterials

Enabling Technologies (e.g., depackaging and pre-treatment)

Separation & Measurement

Relationships with Waste Haulers

Waste Audits by Waste Haulers

WHAT'S NEEDED

\$15.9B

INVESTMENT ANNUALLY

\$3.6B PUBLIC

\$10B PRIVATE

\$2.2B PHILANTHROPIC

40+

SOLUTIONS

WASTE REDUCTION

18.8M
ANNUAL FOOD WASTE
DIVERSION (TONS)

IMPACT PER YEAR



\$60.8B NET FINANCIAL BENEFIT



5T GALLONS IN WATER SAVINGS



79M MT CO₂e EMISSION REDUCTION
POTENTIAL



4.6B MEALS FOR PEOPLE IN NEED



50K JOBS CREATED THROUGH FULL
SOLUTION IMPLEMENTATION

Source: ReFED/2023 Data (Published Feb 2025)

REFED INSIGHTS ENGINE: The System Tool Driving Change



Understand the Problem

Visit the [Food Waste Monitor](#) ►



Explore the Solutions

Visit the [Solutions Database](#) ►



Find Solution Providers

Visit the [Solution Provider Directory](#) ►



Calculate Impact

Visit the [Impact Calculator](#) ►



Track Capital

Visit the [Capital Tracker](#) ►



Review Policies

Visit the [Policy Finder](#) ►

Launch Insights Engine



190,000
users



6 countries
requested
international IE



73.9 million Surplus Food Tons

were generated in All Sectors across All States in 2023

Destinations Food Types Causes Sectors

BACK

- Landfill
24.2M Tons - 32.7%
- Not Harvested
14.5M Tons - 19.7%
- Composting
12M Tons - 16.3%
- Animal Feed
8.09M Tons - 10.9%
- Land Application
3.87M Tons - 5.2%
- Sewer
3.5M Tons - 4.7%
- Incineration
3.03M Tons - 4.1%



Data Quality



2016

2017

2018

2019

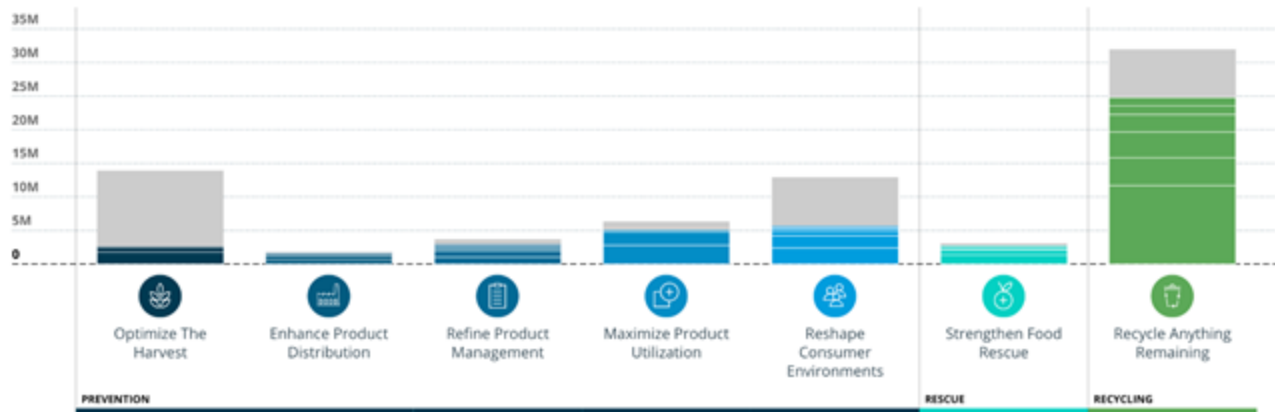
2020

2021

2022

2023

ANNUAL FOOD WASTE DIVERSION POTENTIAL OF FOOD WASTE SOLUTIONS TONS



IMPACT METRIC:

[Net \\$](#)
[Tons](#)
[Total Emissions \(CO2e\)](#)
[Methane](#)
[Water](#)
[Meals](#)
[Jobs](#)
[HIDE FILTERS](#)

STAKEHOLDERS: [All Stakeholders](#)
 DATA VIEW: [Total](#)
 FOOD TYPE: [All Food Types](#)
 CAPITAL TYPE: [All Capital Types](#)
 STATES: [All States](#)

ACTION AREA	SOLUTION NAME	FOOD WASTE DIVERSION	ANNUAL INVESTMENT REQUIRED	
	Centralized Composting	11.7M Tons	\$ 2.38B	VIEW DETAILS
	Centralized Anaerobic Digestion	4.09M Tons	\$ 989M	VIEW DETAILS
	Co-Digestion At Wastewater Treatment Plants	3.83M Tons	\$ 844M	VIEW DETAILS



ReFED



Impact Calculator

Calculate the environmental and social impacts of food waste.

INSIGHTS
ENGINEFOOD WASTE
MONITORSOLUTIONS
DATABASESOLUTION
PROVIDER
DIRECTORYIMPACT
CALCULATORCAPITAL
TRACKER

POLICY FINDER

EDIT SELECTIONS

SECTOR

Farm

FOOD TYPE

Produce

INPUT UNITS

Tons

CURRENT SCENARIO

1000000 tons

Not Harvested

ALT SCENARIO

1000000 tons

Donations

Impact Results

IMPACT METRIC:

Total Emissions (CO₂e)

Methane

Water

Meals

DOWNLOAD RESULTS



Total Lifecycle Emissions Footprint

CURRENT SCENARIO

169,063

Metric tons of CO₂e

EQUALS

430.18

Million miles driven by an average gasoline-powered passenger vehicle

ALTERNATIVE SCENARIO

54,977

Metric tons of CO₂e

EQUALS

139.89

Million miles driven by an average gasoline-powered passenger vehicle

NET BENEFIT

114,085

Metric tons of CO₂e avoided

EQUALS

290.29

Million miles driven by an average gasoline-powered passenger vehicle

CO₂E EMISSIONS

CURRENT SCENARIO



ALTERNATIVE SCENARIO

EQUIVALENCY METRIC

Miles Driven

DOWNLOAD
FACTORS

METHODOLOGY



GLOSSARY

ABOUT THIS
TOOLHELP &
RESOURCES



From Surplus to Solutions:

2025 ReFED U.S. Food Waste Report

AVAILABLE NOW!



The 2026 **ReFED** Food Waste Solutions Summit

May 19-21, 2026 • Charlotte, NC

#FoodWasteSummit26



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