



OH, SCRAP!

The Global Impacts of Food Waste

An agricultural reader for secondary students

Science & Social Studies



VOCABULARY

Byproduct	An incidental or secondary product made in the manufacture or synthesis of something else
Carbon dioxide equivalent (CO₂e)	The number of metric tons of CO ₂ emissions with the same global warming potential as one metric ton of another greenhouse gas
Carbon footprint	The total greenhouse gas emissions caused by an individual, place, or product, expressed as carbon dioxide equivalent
Commodity chain	Food moves from "farm to table" through the food life cycle: agricultural production, postharvest handling and storage, processing, distribution, consumption, end of life
Food and Agriculture Organization of the United Nations	A specialized agency of the United Nations that leads international efforts to defeat hunger
Food insecurity	A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life
Food loss	The edible amount of food, available for human consumption but not consumed for any reason, including loss from mold, pests, inadequate climate control, cooking loss, natural shrinkage (moisture loss), food waste, and unharvested food
Food Recovery Hierarchy	A hierarchy that prioritizes actions that organizations and individuals can take to prevent and divert wasted food
Food waste	Occurs when food is discarded prematurely or unnecessarily
Global North	Developed societies of Europe and North America which are characterized by established democracies, wealth, technological advancement, political stability, and dominance of world trade and politics
Global South	Developing countries representing mostly agricultural economies in Africa, India, China, and Latin America that are characterized by turmoil, war, poverty, lower life expectancy, and lower levels of education
Hunger	An uncomfortable or painful physical sensation that occurs when a person does not eat enough calories on a regular basis to lead a normal, active, and healthy life
Landfill	A system of trash and garbage disposal in which the waste is buried between layers of earth to build up low-lying land
Processed product	The process of transforming raw agricultural products, like grains, vegetables, meat, or milk, into end products to be sold to consumers
Ruminant	A mammal with a four-compartment stomach that chews the cud regurgitated from its rumen; ruminants include cattle, sheep, goats, deer, and bison
Surplus food	Available food that goes unsold or uneaten
U.S. Environmental Protection Agency	The mission of the EPA is to protect human health and the environment
United Nations Sustainable Development Goals	A call for action by all countries to promote economic growth and address social needs (education, health, social protection, job opportunities) while protecting the planet
Unprocessed product	A raw product that has not had any chemical or industrial treatment in order to preserve it, or improve its taste or appearance
World Food Programme	The food assistance branch of the United Nations focused on hunger and food security, and the largest provider of school meals

FOOD WASTE VS FOOD LOSS

FOOD WASTE occurs when food is discarded prematurely or unnecessarily.



Less desirable or "ugly" food is not purchased



Uneaten food is thrown away in homes or at restaurants



Food expires before it is purchased or eaten

FOOD LOSS occurs when food is destroyed or damaged before it is eaten by consumers.

Crops are damaged from insect infestations or improper storage



Food is lost due to extreme weather conditions



Food is destroyed during transportation



Did you know?

- An estimated 30-40% of all available food in the U.S. is wasted (it would be as if each American wasted 20 pounds of food each month)
- In high-income countries, **food waste** is more prevalent
- In low-income countries, **food loss** is more prevalent

TRY THIS OUT!



FOOD WASTE MONITOR

In 2022, the United States generated 88.7 million tons of **surplus food**, which is 38% of total production. Explore this interactive chart to learn more about surplus food waste, possible solutions, and potential innovators. <https://insights-engine.refed.org/food-waste-monitor?view=overview&year=2022>

- What percentage of the 88.7 million tons of surplus food ended up in **landfills**? (Click the chart for more details)

Thirty-percent of the world's food is wasted

The global outlook of food waste is distinct between developed countries (the Global North) and developing countries (the Global South).

The causes of food waste in the **Global North** are mainly related to consumer behavior and a lack of coordination between the stages of the food commodity chain.

The causes of food loss in the **Global South** are mainly related to the monetary, managerial, and technical limitations in storing, and refrigeration of food.

Visit this page on the United Nations Sustainable Development Goals

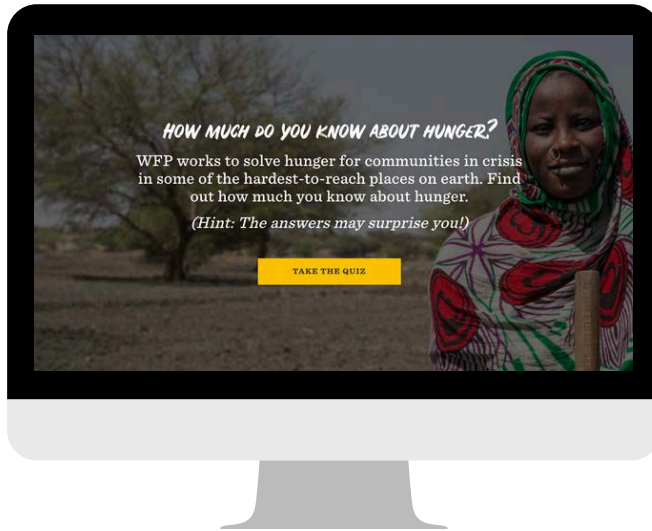
<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

- Which two goals are related to food waste and food loss? (Hint: They are the same color.)
- Read about these goals and list 3 facts that you learned related to food waste and food loss.
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- Read the goals' targets. Do you think the targets are realistic? Why or why not?

FOOD WASTE & ITS IMPACT ON HUNGER

Food waste and **hunger** are directly related. It is estimated that nearly 690 million people worldwide are hungry. But, if 15% of food wasted each year in the U.S. were rescued, it could feed nearly 25 million people annually.

Take this online hunger quiz:
<https://quiz.wfpusa.org/quiz/hunger/>



What information about hunger surprised you the most?

A large empty rectangular box for writing an answer. An orange arrow points from the text "What information about hunger surprised you the most?" to the top-left corner of the box.

ESPeN IMPACTS OF FOOD WASTE



Economic

- The direct economic cost of food waste of agricultural products—excluding fish and seafood—is over 750 billion U.S. dollars, equivalent to the gross domestic product of Switzerland
- The impacts of COVID-19 threaten the fight against global poverty; it is estimated that the number of people in extreme poverty will rise an additional 88 to 115 million by the end of 2021



Social

- Having enough money to buy nutritious food is affected by food prices and people's purchasing power; for example, in sub-Saharan Africa and southern Asia, approximately 57% of the population is unable to afford a healthy diet
- Wasting food also wastes the time and energy of those who produce our food



Political

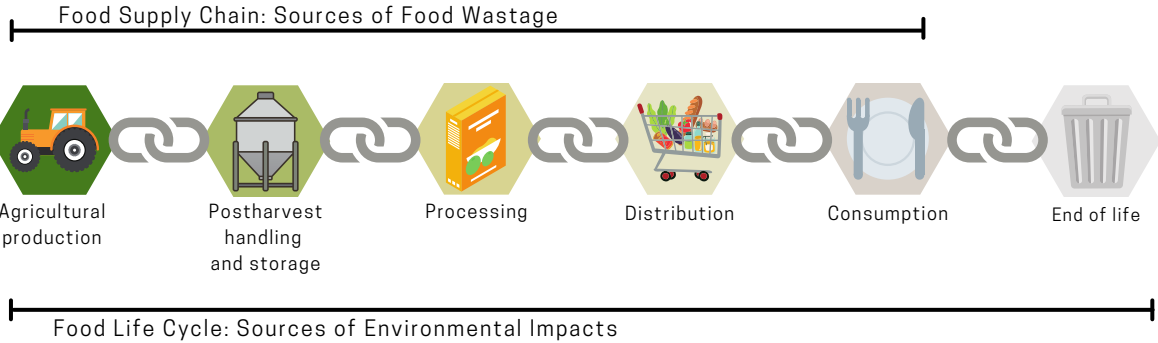
- Policy intervention is needed to address the issue of food waste; for example, cities need to implement ordinances and practices that reduce the amount of waste sent to municipal landfills



eNvironmental

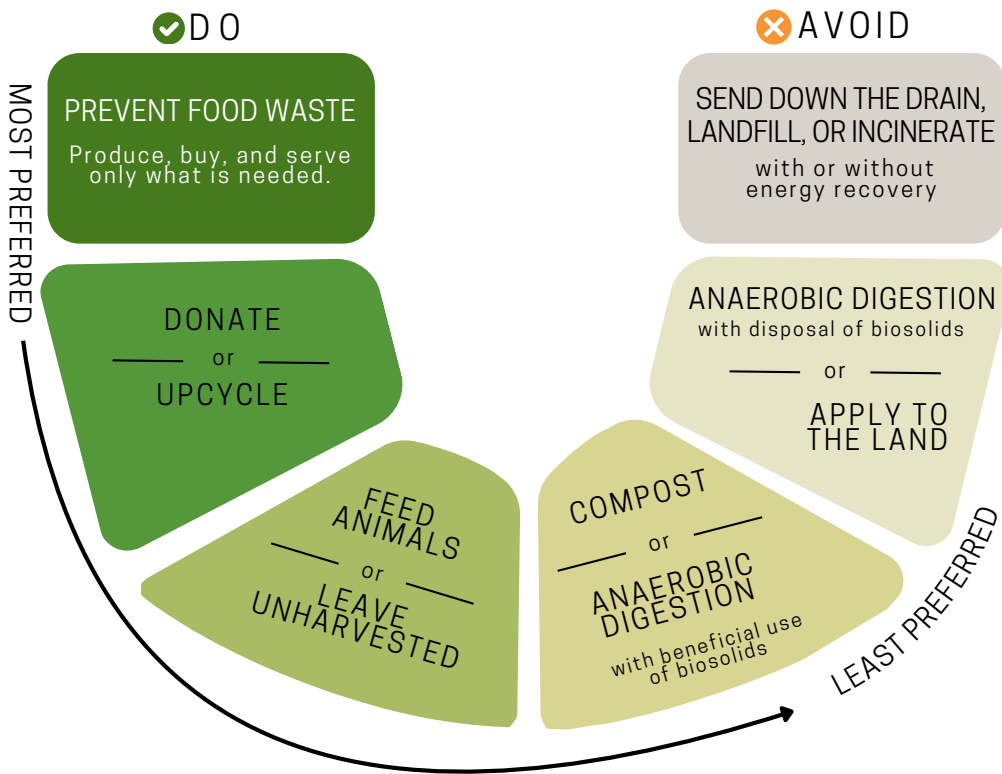
- Asia experiences a high quantity of wastage and methane emission from rice production; it also experiences negative impacts on air, water, and land from cereal production
- Wastage of meat is low in all countries; however, high income regions waste approximately 67% of meat
- Fruit wastage in Asia, Latin America, and Europe results in polluted surface ground water
- Vegetable wastage in industrialized Asia, Europe, and South and Southeast Asia constitutes a high **carbon footprint**

FOOD COMMODITY CHAIN



During the food **commodity chain**, food waste can occur due to spillage, breakage, degradation during transportation or handling, and waste during the distribution stage. If food is wasted further down the food chain, this results in higher environmental impacts.

WASTED FOOD SCALE



Which areas of the wasted food scale can you contribute to, in order to prevent wasted food from reaching the landfill?

FARMS & FOOD

HOW DO COWS HELP MITIGATE FOOD WASTE?

Did you know? Dairy cows help reduce food waste by eating **byproducts** that humans can't eat or digest. By eating human-inedible foods, cows divert approximately 204-306 million pounds of food waste from landfills. The **Food and Agriculture Organization of the United Nations (FAO)** estimates that food waste and food loss accounts for 8% of greenhouse gas emissions.

Cows, who are **ruminant** animals, eat byproducts that would normally end up in landfills. They convert the waste into digestible foods that humans can enjoy such as milk and beef products. Up to 30% of a U.S. dairy cow's diet is made up of human inedible byproducts, which not only reduces the amount of food waste going to landfill, but reduces the costs of growing feed and purchasing new feed products.

Although food waste can occur at any stage of the food supply chain, dairy cows' consumption of byproducts is a significant contribution to mitigating potential landfill emissions.



Sugar beets



Sugar beets are processed into white sugar, brown sugar, and molasses



Beet pulp is the **byproduct** resulting from sugar production



Cows convert beet pulp into milk and other dairy products



Other examples of byproducts fed to dairy cattle:

UNPROCESSED PRODUCT	PROCESSED PRODUCT	BYPRODUCT FED TO COWS
Sugar beets	White sugar	Sugar beet pulp
Corn	Ethanol	Distillers grain
Milk	Cheese	Whey
Unhulled almonds	Almonds	Almond hulls
Cherries	Juice	Cherry pulp

BE A FOOD HERO!

REDUCE FOOD WASTE AT HOME & SCHOOL

At home, encourage those responsible for buying and preparing your food to:

- Buy ugly food
- Buy food from local producers
- Plan meals ahead
- Store food properly
- Eat older foods and leftovers before buying more food
- Freeze leftover food


Did you know?
An average family of four
can save \$1,500 to \$1,800
a year by eating all the
food they buy.



At school:

- Take smaller portions
- Take time to enjoy your food while eating
- Sort your plate waste into compost bins
- Start a worm composting bin in your classroom
- Form a student club to create a food waste reduction campaign

What other ideas do you have for reducing food waste at home and at school?



TRY THIS
OUT!



FoodKeeper App

The FoodKeeper helps you understand food and beverages storage. It will help you maximize the freshness and quality of items. By doing so you will be able to keep items fresh longer than if they were not stored properly. It was developed by the USDA's Food Safety and Inspection Service, with Cornell University and the Food Marketing Institute.

Link: <https://www.foodsafety.gov/keep-food-safe/foodkeeper-app>



THE GOOD NEWS!

- The United Nations and the U.S. federal government embraced goals to reduce their food waste by 50% by 2030
- Business at all stages of the commodity chain have committed to reduce food waste in their operations
- In a U.S. public opinion poll, 74% of respondents said that the issue of food waste is important to them



SOURCES

Sources used for the content for this reader include U.S. Environmental Protection Agency Region 8 Sustainable Materials Management Program and the resources listed below. Although this project was funded by the U.S. Environmental Protection Agency, it does not necessarily reflect the views of the Agency and no endorsement should be inferred.

- United Nations Sustainable Development Goals
- World Food Programme
- World Food Program USA
- Food and Agriculture Organization of the United Nations
- Natural Resources Defense Council
- Darigold Sustainability and Stewardship
- USDA Economic Research Service

