Tips on reducing food waste in cities

Webinar, April 24, 2019

Craig Hanson (Vice President of Food, Forests, Water & the Ocean) World Resources Institute
Liz Goodwin (Senior Fellow and Director, Food Loss & Waste) World Resources Institute
Agenda

Introductions

Some basics

“Business case” for reducing food waste

Strategy for reducing food waste

Q&A
WRI is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.
WRI and food loss & waste

A unique coalition of leaders dedicated to inspiring ambition, mobilizing action, and accelerating progress toward achieving SDG Target 12.3
Some notable Champions 12.3 accomplishments

2/3 of 50 largest food companies now have FLW targets

Food companies to standardize date labels

... and much more
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Q&A
What is food loss and waste?

Food intended for human consumption but not eaten by people for whatever reason

Some definitions and estimates also include associated inedible parts (e.g., rinds, pits, bones)
Why does food loss and waste matter?

1/3 of all food is lost or wasted each year.

Food loss and waste costs the global economy $940 BILLION each year.

8% of annual global greenhouse emissions are due to food loss and waste.

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Q&A
There are many benefits from reducing food loss and waste

**Social**
- Feed those in need
- Improve food security for a growing population

**Economic**
- Avoid unnecessary costs
- Generate new revenue sources

**Environmental**
- Conserve and protect natural resources
- Contribute to reducing climate change
Financial returns for companies

>700 companies

Nearly 1,200 business sites

Across 17 countries
99% of sites had a positive return on their investment. Half earned at least $14 on every $1 invested.
Financial returns for a city: West London
FIGURE 3. **Distribution of benefits and costs: West London**

*Benefits and costs attributable to the food waste reduction initiative for six West London boroughs.*

West London: What were the financial benefits and costs?

Costs
• Quantifying and monitoring
• Advertising via radio, print, and digital (providing tips on planning, storage, recipes, etc.)
• Conducting 50 public relations activities, events, and community engagements

Benefits
• Avoiding food waste disposal costs
• Avoiding expenditures on food that otherwise would be wasted
West London: By the numbers

For every £1 invested in curbing household food waste:

• Local authorities saved £8
• Households saved £84

Catalyzed a 15% reduction in household food waste within 6 months

Photo: thetimes.co.uk
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The strategy for reducing food waste consists of 3 elements

- Target
- Measure
- Act
TARGET: Targets set ambition, and ambition motivates action
TARGET 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
National governments and regional bodies with specific food loss and waste reduction targets aligned with SDG 12.3 (as of early 2019)

Source: WRI analysis
MEASURE: “What gets measured gets managed”

- **Where** is food being wasted?
- **How much** food is being wasted?
- What is **causing** it?
- What **interventions** are needed?
- How am I **progressing** toward my target?
• Global standard
• Guidance for quantifying and reporting on weight of FLW

• Answers:
  – Why quantify
  – What to quantify
  – How to quantify
An increasing number of companies and others are setting targets and measuring food loss and waste (not exhaustive)

U.S. Food Loss and Waste 2030 Champions

TESCO’s major suppliers

Courtauld 2025 (U.K.):

Plus... EPA Food Recovery Challenge Participants
Plus... Consumer Goods Forum members
Some starting helpful hints on measurement

1. You don't need a super accurate number to get started
2. Build on existing data (e.g., waste collection receipts, retailer scanner data, input/output data)
3. Waste composition analysis gives good numbers
4. Speak to other divisions (since data often resides there)
5. Learn from other cities and from local private sector
6. Measurement itself triggers prevention
ACT: What ultimately matters is action
## FIGURE 6. Possible approaches for reducing food loss and waste (not exhaustive)

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>HANDLING &amp; STORAGE</th>
<th>PROCESSING &amp; PACKAGING</th>
<th>DISTRIBUTION &amp; MARKET</th>
<th>CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Convert unmarketable crops into value-added products</td>
<td>• Improve storage technologies</td>
<td>• Reengineer manufacturing processes</td>
<td>• Provide guidance on food storage and preparation</td>
<td>• Reduce portion sizes</td>
</tr>
<tr>
<td>• Improve agriculture extension services</td>
<td>• Introduce energy-efficient, low-carbon cold chains</td>
<td>• Improve supply chain management</td>
<td>• Change food date labeling practices</td>
<td>• Improve consumer cooking skills</td>
</tr>
<tr>
<td>• Improve harvesting techniques</td>
<td>• Improve handling to reduce damage</td>
<td>• Improve packaging to keep food fresher for longer, optimize portion size, and gauge safety</td>
<td>• Make cosmetic standards more amenable to selling “imperfect” food (e.g., produce with irregular shape or blemishes)</td>
<td>• Conduct consumer education campaigns (e.g., general public, schools, restaurants)</td>
</tr>
<tr>
<td>• Improve access to infrastructure and markets</td>
<td>• Improve infrastructure (e.g., roads, electricity access)</td>
<td>• Reprocess or repackage food not meeting specifications</td>
<td>• Review promotions policy</td>
<td>• Consume “imperfect” produce</td>
</tr>
</tbody>
</table>

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“To do” list for retailers

✓ Improve **training of staff** on product handling and stock rotation

✓ Optimize **inventory management systems** (and increase flexibility in supplier contracts) to better match forecasting and ordering

✓ Enable consumers to purchase **smaller** or customized portions, such as through bulk bins or staffed seafood and meat counters

✓ Adjust **promotions** to avoid excessive purchase of additional items (e.g., offer “half off” or “mix-and-match” deals rather than two-for-one offers)

✓ Redesign in-store merchandising to achieve the desired **appearance of abundance** but with less damage and excess product (e.g., through smaller bins and bowls)

✓ **Educate consumers** about better food management (e.g., proper storage, meal planning, understanding date labels, safe food handling, cooking tips)
“To do” list for restaurants

✓ Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, reward staff who deliver against targets)

✓ Shift away from preparation methods such as batch cooking, casserole trays, and buffets to reduce overproduction

✓ Revisit inventory management and purchasing practices to better fit needs based on historical trends and waste data

✓ Repurpose surplus food (e.g., by safely incorporating unused items into other dishes, by donating it)

✓ Use scales in the kitchen to weigh food (and estimate financial cost) before disposing of the food
“To do” list for public institutions

- Reduce the amount **overprepared** (e.g., by preparing smaller quantities of items that are consistently under-consumed)
- Introduce techniques to minimize people taking too large of **portions** (e.g., tray-less dining, flexible portion sizes, introduce pay-by-weight pricing system)
- Repurpose **surplus** food (e.g., by safely incorporating unused items into other dishes, by donating it)
- Leverage **public procurement** power
- **Remove policy barriers** to food redistribution (e.g., liability limitations, tax breaks)
- Launch **measurement** program
“To do” list for households

✓ **Buy only what you expect to eat** (check refrigerator and cupboards before shopping, use a shopping list, and plan meals in advance)

✓ Know the difference between ‘**use by**’ (which is about food safety) and ‘**best before**’ (which is about quality and still safe to eat after this date)

✓ Freeze or preserve food before it spoils, and find out how to best **store** different foods so they stay fresh and safe longer

✓ Find creative ways to use **leftover** ingredients and products past their peak quality (e.g., in soups, sauces, smoothies), as well as to cook the parts you may not normally eat (e.g., stems, cores)

✓ **Organize** the kitchen and refrigerator so that items do not get lost and spoil
Insights from London

- Households were largest source of food waste
- Fruit and vegetables the most wasted foods, followed by bread and dairy
- Retailers are a way to access the consumer (since they are the final touch point before consumers go home with food)
- Celebrity chefs are a way to reach consumers, too
- Hospitality sector can also help influence attitudes (and very visible, high profile source of food waste)
# Common causes of consumer food waste

<table>
<thead>
<tr>
<th>Most common causes</th>
<th>Solutions implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of <strong>planning</strong> (buying too much)</td>
<td>Encourage shopping lists and meal planning</td>
</tr>
<tr>
<td>Wrong <strong>portion sizes</strong> (cook too much)</td>
<td>Give tips on portion sizes</td>
</tr>
<tr>
<td>Poor <strong>cooking skills</strong></td>
<td>Give cooking guidance</td>
</tr>
<tr>
<td>Lack of imagination on what to do with <strong>leftovers</strong></td>
<td>Offer recipes for leftovers</td>
</tr>
<tr>
<td>Inadequate <strong>storage</strong></td>
<td>Give tips on proper food storage (e.g., on shopping bags, on packages, on displays)</td>
</tr>
<tr>
<td>Confusion around <strong>date labels</strong></td>
<td>Streamline date labels (1 per package) &amp; education</td>
</tr>
</tbody>
</table>

*Over time, communication with households changed from doing it directly via advertisements to going through the retailers (e.g., retailers putting storage advice on packages or on the shelf by the products)*
Government outreach (examples) . . .

SAVE FOOD
SAVE MONEY

FREEZE, TOAST AND EAT ME...
just don’t bin me!

7 TOP TIPS TO AVOID FOOD WASTE

POTATO LOVERS hate waste

Saturday
7th May
10.00am - 3.00pm
Village Hall
... to retailers “making it easy” to reduce food waste

FareShare FoodCloud in Tesco stores

Get to know your shelf, use up your leftovers.

#EXPRESSYOURSELF
Office Food Waste Challenge
www.officefoodwastechallenge.org

HOW TO CONDUCT A WASTE COMPOSITION ANALYSIS IN YOUR OFFICE

The following outlines how to conduct a Waste Composition Analysis, the recommended method for quantifying an office’s food waste.

**STEP 1** Pick a date/time and recruit staff to help measure
Pick a date and time and recruit staff to help measure. Try to pick a “typical” day as the measurement is not skewed. Measure several days, then average the waste to get a “typical” office waste. Remember to consider holidays and weekends. For example, November and December have fewer holidays, while March and April have more. It is important to consider weekdays, as weekends often see less office activity.

**STEP 2** Gather the necessary equipment and pick a place to measure
You will need to collect waste from every kitchen, café, and cafeteria at your office. This involves collecting the waste from where food is disposed. Be sure to select receptacles dedicated to recycling, as offices sometimes mistakenly put food waste in recycling bins. This often results in a very large number of misclassified or incorrectly labeled items.

**STEP 3** Determine what you want to measure
Try to measure the waste from every kitchen, café, and cafeteria at your office. This involves collecting the waste from where food is disposed. Be sure to select receptacles dedicated to recycling, as offices sometimes mistakenly put food waste in recycling bins. This often results in a very large number of misclassified or incorrectly labeled items.

TIPS FOR REDUCING OFFICE FOOD WASTE

Once you have measured your office food waste, you will know how much and where the food waste is happening. Here are some tips to get you started.

**ON-SITE CANTEENS AND CAFETERIAS**
Where food is available for staff to purchase:

- Ask your food service provider to reduce the amount of food wasted in their preparation kitchen and at your site. A test sell-your-own theme will encourage them to change their food practices.
- Measure the food that is discarded and the amount of food that is returned at the end of the day to determine where the food is being thrown away.
- For high-volume sets, a cold storage or a cold storage area can be used to reduce waste.
- Ask a member of your team to roll out a waste reduction program in the cafeteria.

**LUNCH BREAKOUT AREA**
Where staff bring their own food, often after an on-site refrigerator:

- Share your lunch refrigerator with your neighbors or keep it for yourself.
- Designate a “waste shelf” to store food that has been opened but not eaten. This shelf can be used for snacks or mini-microwaves.
- Post signs near the refrigerator, asking people to use the refrigerator for snacks.
- Ensure that your refrigerator is clean and free of odors.
- Place food that is not intended for consumption in the refrigerator.
- Refrigerate food that requires refrigeration, such as milk, cheese, and meats.
- Use the refrigerator for snacks, coffee, and tea, rather than food items.
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APPENDIX
What to quantify?

(1) Material Types (i.e., food and/or inedible parts)

AND

(2) Destinations (where material goes when it leaves the food supply chain; 10 possibilities)

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*a Intended for human consumption (i.e., excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use)

*b At some point in the food supply chain (including surplus food redistributed to people and consumed)

What is meant by “material type”?

**Food:** Any substance—whether processed, semi-processed, or raw—that is intended for human consumption.

**Apple (Raw)**

- **Core and stem (10%)**
- **Skin (13%)**

**Inedible parts:** Components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans.

*Source: USDA (2015)*
Scope of a “food loss and waste inventory”

Timeframe

Material Type

- Food
- Inedible parts

Destination

- Animal feed
- Biomaterial/processing
- Co/anaerobic digestion
- Compost/aerobic
- Controlled combustion
- Land application
- Landfill
- Not harvested
- Refuse/discards
- Sewer

Boundary

- Food category
- Lifecycle stage
- Geography
- Organization

Weight of packaging shall be excluded
Scope recommended by Champions 12.3 and GAA

- **TIMEFRAME**: 12 months
- **MATERIAL TYPE**: Food, Inedible parts
- **DESTINATION**: Animal feed, Biomaterial/processing, Co/anaerobic digestion, Compost/aerobic, Controlled combustion, Land application, Landfill, Not harvested, Refuse/discards, Sewer
- **BOUNDARY**: Food category = All food, Lifecycle stage = Direct operations, Geography = All locations, Organization = All FLW-producing units

Hierarchy of destinations for achieving SDG Target 12.3

FIRST PRIORITY: Food to people

NEXT: Aim for high valorization

TARGET: Waste stream to be reduced by 50%

With energy recovery:
- Co/anaerobic digestion
- Compost/aerobic
- Land application
- Not harvested

Without energy recovery:
- Controlled combustion
- Landfill
- Sewer
- Refuse/discards

Contributes to meeting SDG Target 12.3
- Prevention and redistribution to people
- High valorization
- Some valorization
- No valorization

Potential food loss and waste

For more information:
https://champs123blog.files.wordpress.com/2017/10/champions-12-3-guidance-on-interpreting-sdg-target-12-3.pdf
How to quantify?

1. Direct weighing
2. Counting
3. Assessing volume
4. Waste composition analysis
5. Records
6. Diaries
7. Surveys
8. Mass balance
9. Modeling
10. Proxy data
### How to quantify: Options

The FLW *Standard* does not require use of a particular quantification method – but provides guidance on 10 methods in *Guidance on FLW Quantification Methods*.

1. Direct weighing
2. Counting
3. Assessing volume
4. **Waste composition analysis**
5. Records
6. Diaries
7. **Surveys**
8. Mass balance
9. Modeling
10. Proxy data

* Methods noted in bold are common among cities

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**Tools & Resources**

- **Guidance on Quantification Methods**
  - You have several options for how to quantify food loss and waste.
  - In this companion to the FLW Standard, you will find guidance on 10 of the most common methods. To help you select which method may be most appropriate for your circumstances, try out the FLW Quantification Method Ranking Tool. This straightforward tool offers suggestions based on a short set of questions.
  - **Download individual chapters with tips on using each method @ www.FLWProtocol.org**
Online tool to help you select the appropriate quantification method

FLW Quantification Method Ranking Tool
(June 2016)

Introduction

**Purpose:** This tool is designed to accompany the Food Loss and Waste Accounting and Reporting Standard (FLW Standard). It provides suggested methods for quantifying food loss and waste (FLW).

**Instructions:** Answer all the questions below to the best of your ability by using the drop-down menus, then press the "Get results" button. This will take you to the Results Tab which ranks all the methods included in the FLW Standard (see Chapter 7). You may need to click "Enable macros" when prompted by Excel in order to use this sheet.

Note:
- The "Methodology Tab" explains how this ranking of methods was developed.
- The recommendations provided do not take into account the availability of resources (e.g., budget, staff time). The tool does not consider which methods would work well in combination (see "Methodology Tab" for additional details).
- We welcome your questions and suggestions. Please contact Brian Lipinski at BLipinski@wri.org.

Questions

1. How important is it to have a low level of uncertainty (high degree of accuracy in the FLW results)? Note: A higher degree of accuracy is recommended when monitoring targets.
2. Is it necessary to determine the reasons why FLW is generated?
3. Can you get direct access to the FLW being quantified?
4. Is the FLW (whether packaged or not) mixed with other items or materials (e.g., soil, garden / yard waste, nonorganic solid waste, etc.)?
5. Is the FLW mainly liquid or solid?
6. Does all, some, or no FLW go down the drain/sewer?
7. Are inputs and outputs recorded that could be used for inferring the amount of FLW? (e.g., in a factory, the amount of ingredients entering the site and the amount of product leaving the site)
8. Is there existing information that describes how FLW varies in response to other factors (e.g., with climate, soil conditions, crop / food type)?
Food retailer: Tesco

Surplus donations since 2013/14 (tonnes)

- 2013/14: 268
- 2014/15: 1,383
- 2015/16: 2,303
- 2016/17: 5,700

During 2016/17 our rate of donation has increased. The projected surplus donations for 2017/18 is 11,700 tonnes.

2016/17 food waste by category (surplus minus donations and animal feed)

- Produce 35%
- Chilled 26%
- Meat, Agriculture & Local 6%
- Bakery 8%
- Impulse 7%
- Frozen 6%
- Grocery 6%
- Beers, Wine & Spirits 3%
- Euphoria 1%

Total: 46,684 tonnes

Food waste recalculation

<table>
<thead>
<tr>
<th>Year</th>
<th>Food waste (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015/16</td>
<td>42,680</td>
</tr>
<tr>
<td>2014/15</td>
<td>42,172</td>
</tr>
<tr>
<td>2013/14</td>
<td>48,182</td>
</tr>
</tbody>
</table>

Destination of 2016/17 food surplus

- Donated: 5,700 (8%)
- Animal feed: 18,794 (26%)
- Anaerobic digestion: 38,653 (54%)
- Energy recovery: 8,031 (11%)
- Landfill: 0

*% do not total 100% due to rounding.

Independent limited assurance for food waste data has been provided by KPMG LLP using the assurance standards ISAE 3000. KPMG has issued an unqualified opinion over the data highlighted in this report with a 0 and the full assurance opinion is available at: www.tescoplc.com/foodwastefigures.

The proportion of food wasted against the total weight of food products sold in Tesco’s UK stores.

Due to our change in definition, we have restated previous years’ waste figures. See www.tescoplc.com/foodwastefigures for further details.

Damaged bakery products contribute to animal feed total. Other food that is damaged or not safe to donate is sent to anaerobic digestion or energy recovery. See www.tescoplc.com/foodwastefigures for further details.
<table>
<thead>
<tr>
<th>Destination</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal feed</td>
<td>Diverting material from the food supply chain(^a) (directly or after processing) to animals</td>
</tr>
<tr>
<td>Bio-based materials/biochemical processing</td>
<td>Converting material into industrial products. Examples include creating fibers for packaging material, creating bioplastics (e.g., polylactic acid), making “traditional” materials such as leather or feathers (e.g., for pillows), and rendering fat, oil, or grease into a raw material to make products such as soaps, biodiesel, or cosmetics. “Biochemical processing” does not refer to anaerobic digestion or production of bioethanol through fermentation</td>
</tr>
<tr>
<td>Codigestion/anaerobic digestion</td>
<td>Breaking down material via bacteria in the absence of oxygen. This process generates biogas and nutrient-rich matter. Codigestion refers to the simultaneous anaerobic digestion of FLW and other organic material in one digester. This destination includes fermentation (converting carbohydrates—such as glucose, fructose, and sucrose—via microbes into alcohols in the absence of oxygen to create products such as biofuels)</td>
</tr>
<tr>
<td>Composting/aerobic processes</td>
<td>Breaking down material via bacteria in oxygen-rich environments. Composting refers to the production of organic material (via aerobic processes) that can be used as a soil amendment</td>
</tr>
<tr>
<td>Controlled combustion</td>
<td>Sending material to a facility that is specifically designed for combustion in a controlled manner, which may include some form of energy recovery (this may also be referred to as incineration)</td>
</tr>
<tr>
<td>Land application</td>
<td>Spreading, spraying, injecting, or incorporating organic material onto or below the surface of the land to enhance soil quality</td>
</tr>
<tr>
<td>Landfill</td>
<td>Sending material to an area of land or an excavated site that is specifically designed and built to receive wastes</td>
</tr>
<tr>
<td>Not harvested/plowed-in</td>
<td>Leaving crops that were ready for harvest in the field or tilling them into the soil</td>
</tr>
<tr>
<td>Refuse/discards/litter</td>
<td>Abandoning material on land or disposing of it in the sea. This includes open dumps (i.e., uncovered, unlined), open burn (i.e., not in a controlled facility), the portion of harvested crops eaten by pests, and fish discards (the portion of total catch that is thrown away or slipped)</td>
</tr>
<tr>
<td>Sewer/wastewater treatment</td>
<td>Sending material down the sewer (with or without prior treatment), including that which may go to a facility designed to treat wastewater</td>
</tr>
<tr>
<td>Other</td>
<td>Sending material to a destination that is different from the 10 listed above. This destination should be described</td>
</tr>
</tbody>
</table>

\(^a\) Excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use
## DEFINITION: *BOUNDARY*

<table>
<thead>
<tr>
<th>Boundary dimension</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Food category      | The type(s) of food included in reported FLW                               | • All food  
• Dairy products  
• Fresh fruits and vegetables  
• Chicken |
| Lifecycle stage    | The stage(s) in the food supply chain or food lifecycle within which reported FLW occurs | • Entire food supply chain  
• Two stages: manufacture of dairy products, and retail of food and beverage  
• At home |
| Geography          | Geographic borders within which reported FLW occurs                       | • World (all countries)  
• Eastern Asia  
• Ghana  
• Nova Scotia, Canada  
• Lima, Peru |
| Organization       | Organizational unit(s) within which reported FLW occurs                   | • All sectors in country  
• Entire company  
• Two business units  
• All 1,000 stores  
• 100 households |
One-third of all food produced in the world is lost or wasted between farm and fork.

The Food Loss and Waste Accounting and Reporting Standard enables companies, countries, cities and others to quantify and report on food loss and waste so they can develop targeted reduction strategies and realize the benefits from tackling this inefficiency.

Learn More
Tools & resources available @

www.FLWProtocol.org