Characterization and Management of Food Waste in North America

Sources, Quantities and Causes

Sources: Just Eat It, A Food Waste Story, 2014; Tetra Tech, 2014
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  ▪ Food Loss and Waste (FLW)
  ▪ Food Recovery Hierarchy

• Food Supply Chain Overview

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  ▪ Global and North America

• Food Waste Causes

Source: Tetra Tech, 2014
Definitions – Food Loss and Food Waste (FLW)

• Food loss
  ▪ Any edible and inedible parts of food that are removed from the food supply chain to be recovered, recycled or disposed. Food loss encompasses food waste. Adapted from FUSIONS 2014

• Food waste
  ▪ Losses occurring at retail, food service and consumer stages are termed food waste to factor in behaviour at those stages. Adapted from Parfitt et al. 2010; Gustavsson 2011 (for FAO)

Sources: Tetra Tech, 2016; Alimento para Todos, 2016
Definitions – Food Recovery Hierarchy

- **Source Reduction** – Actions to minimize surplus food generation and prevent avoidable FLW generation.

- **Recovery for Human Consumption** – Actions to recover safe and nutritious food for human consumption by receiving, storing, or processing food, with or without payment, which would otherwise be discarded or wasted.

- **Recovery for Animal Consumption**
  Actions to recover safe and nutritious food for animal feed through receiving, storing, or processing food, with or without payment, food, which would otherwise be wasted.

- **Recycling** – Actions to recycle food for non-food-related uses, through processes such as industrial processing for compounds like fats and oils, composting, and anaerobic digestion.

- **Disposal** – Actions to dispose of food through controlled and uncontrolled means, such as landfilling, open dumping, incineration and sewage.

Sources: Adapted from EPA (2016a), MacRae et al. (2016), Papargyropoulou et al. (2014), Kelly (2014), WRAP (2013)
What Does the Food Supply Chain Comprise?

- **Food Production Pre-Harvest**: Farming of Plants and Animals
- **Food Production Post-Harvest**: Harvest, Handling & Storage
- **Processing**: Manufacturing, Processing & Packaging
- **Distribution**: Transportation, Distribution & Wholesale
- **Retail**: Grocery, Department, Convenience Stores & Markets
- **Foodservice**: Restaurants, Catering, Accommodations, Eateries & Institutions
- **Consumers**: Purchasing & Home Consumption
- **Unharvested**: Ploughed-In or Animals Left Behind
- **Secondary Markets**: Food Recovery Organizations & Resellers
- **Organics Processors**: Composting & Bio-Energy
- **Disposal**: Landfill & Incineration

**Primary food supply chain**

**Edible food for humans and then animals**

**Food waste destinations**

**Project scope (excludes food production pre-harvest and consumers)**
Food Supply Chain Stages – Project Scope

**Post-Harvest Food Production**
Food handling and storage at farm level, following growing plants or raising animals

**Processing**
Transformation of raw food into products suitable for consumption, cooking or storage

**Distribution**
Transportation of food products from post-harvest to consumer, including wholesale and brokering throughout food supply chain

**Retail**
Sale of food in a consumer-facing store or market

**Foodservice**
Food and beverage providers serving meals or snacks within commercial and institutional settings
Stakeholder Types

• **Industry**
  ▪ Organizations processing, preparing, preserving and distributing food and beverages, and their respective associations

• **Business**
  ▪ Commercial entities that make, buy, or sell food or provide food services in exchange for money

• **Government**
  ▪ Local, regional, state/provincial and federal entities that have responsibilities related to food and food waste

• **Food Recovery Nongovernmental Organizations**
  ▪ Nonprofit or voluntary groups of individuals formed to provide services or advocacy for public policy. Most NGOs referenced in this context work on food recovery to distribute surplus food to food insecure populations
Global and North American Food Waste Efforts

• Global Highlights
  ▪ Sustainable Development Goal to halve food waste (2015),
  ▪ Think.Eat.Save campaign (2013), SAVE FOOD Initiative (2011)

• Regional
Global Food Waste by Weight

- 1.3 billion tonnes of food are wasted annually
  - Approximately one-third of the food produced for human consumption
  - The United Nation’s Food and Agriculture Organization (FAO) uses commodity production volumes reported by the country to generate these estimates

Source: Gustavsson et al., 2011 for FAO
North American Food Waste By Country

1. Food waste tonnage includes food and inedible parts, based on estimates from FAO Food Balance Sheets
2. FAO data includes the market system in distribution (e.g., retail and foodservice)
North American Food Waste Per Capita

Food Waste \(^1\) (kilograms per capita per year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Pre-Harvest</th>
<th>Post-Harvest</th>
<th>Processing</th>
<th>Distribution (^2)</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
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<td>200</td>
<td>300</td>
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<td>United States</td>
<td>500</td>
<td>200</td>
<td>300</td>
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</tr>
</tbody>
</table>

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Food Waste Causes – Overview for North America

Most prevalent food waste causes across the food supply chain¹:

- Overproduction from processors, wholesalers and retailers
- Damage
- Lack of cold chain infrastructure
- Food grading specifications
- Customer demand
- Market fluctuations

¹. Causes listed pertain to all three countries with the exception of cold chain management, which is being actively addressed in Mexico

Source: Fairway Market NYC, 2016
Food Waste Causes – Post-Harvest Food Production

- Damage
- Order cancellation
- Rigid contract terms
- Variable market prices/high labor costs
- Cosmetic expectations
- Lack of storage infrastructure

Sources: Tetra Tech, 2016; Alimento para Todos, 2016
Food Waste Causes – Processing

- Trimming for consistency
- Order cancellation
- Customer demand
- Overproduction
- High cost of investment
- Improper labelling
- Misshapen products
- Contamination

Source: ReFED, 2016
Food Waste Causes – Distribution

- Inadequate packaging
- Damage
- Lack of cold chain infrastructure

Source: ReFED, 2016
Source: Alimento para Todos, 2016
Food Waste Causes – Retail

- Adverse to change stocking practices or product sizes
- Overstocking
- Misinterpretation of food safety standards
- Customer demands
- “Sell by” date labeling
- Unreliable cold storage
- Modification or cancellation of orders

Source: Medellín Market, 2016
Causes of Food Waste – Foodservice

- Poor food preparation and training techniques
- Overfilling dishes
- Large plates and trays
- Difficulty assessing demand
- Variety in menu options
- Fixed price buffets
- Hygiene rules
- Lack of cold storage

Sources: Feeding the 5000, 2016
Thank you

Questions?

Source: Tetra Tech, 2015