

# Food Loss + Waste

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## PROTOCOL

### **TWO PART WEBINAR**

**Part 1. Resources to use the FLW Standard**

**Part 2. Open question & answer period**

December 13, 2017

By Kai Robertson  
Lead Advisor, FLW Protocol, World Resources Institute

Part 1.

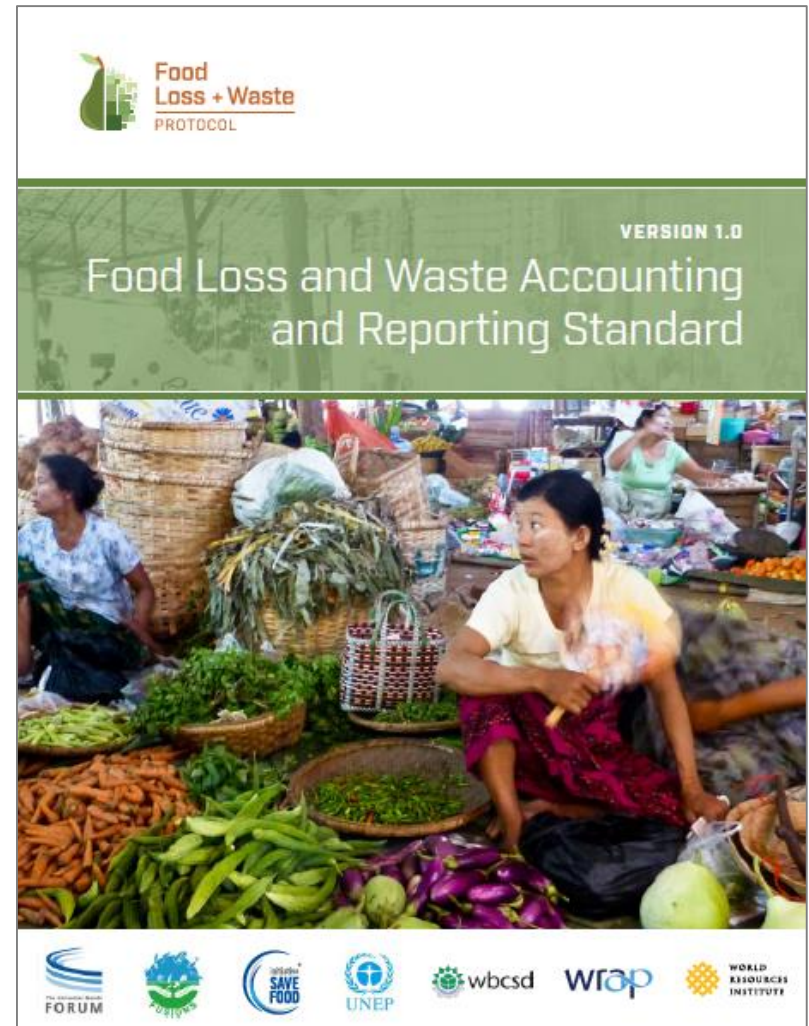
Resources to Use the  
FLW Standard

# Value Gained By Using the *FLW Standard*

- ✓ **Common language**
- ✓ **Practical guidance**
- ✓ **Reporting framework**

“... provides consistent language to use ... and standard ways to measure and report.”

*Kellogg Company*



[Why Measure?](#)[FLW Standard](#)[News & Updates](#)[About the FLW Protocol](#)

**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](#)

## DOWNLOADS

FLW Standard Executive Summary  
📄 (PDF) - [ENG](#) | [CHI](#) | [JAP](#) | [POR](#) | [SPA](#)

FLW Standard  
📄 (PDF) - [ENG](#) | [SPA](#)

Sample Reporting Template for FLW Standard  
📄 (XLS) - [ENG](#)

Guidance on FLW Quantification Methods  
📄 (PDF) - [ENG](#)

FLW Quantification Method Ranking Tools  
📄 (XLS) - [ENG](#)

[Learn to Use These Resources](#)

# Where to Start? The Executive Summary

[Why Measure?](#)[FLW Standard ▾](#)[News & Updates](#)[About the FLW Protocol](#)

**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.

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[FLW Standard Executive Summary](#)[📄 \(PDF\) – ENG | CHI | JAP | POR |](#)[SPA](#)[FLW Standard](#)[📄 \(PDF\) – ENG](#)[Sample Reporting Template for FLW Standard](#)[📄 \(XLS\) – ENG](#)[Guidance on FLW Quantification Methods](#)[📄 \(PDF\) – ENG](#)[FLW Quantification Method Ranking Tools](#)[📄 \(XLS\) – ENG](#)[Learn to Use These Resources](#)

# Steps to Quantify and Report on FLW

Why quantify?



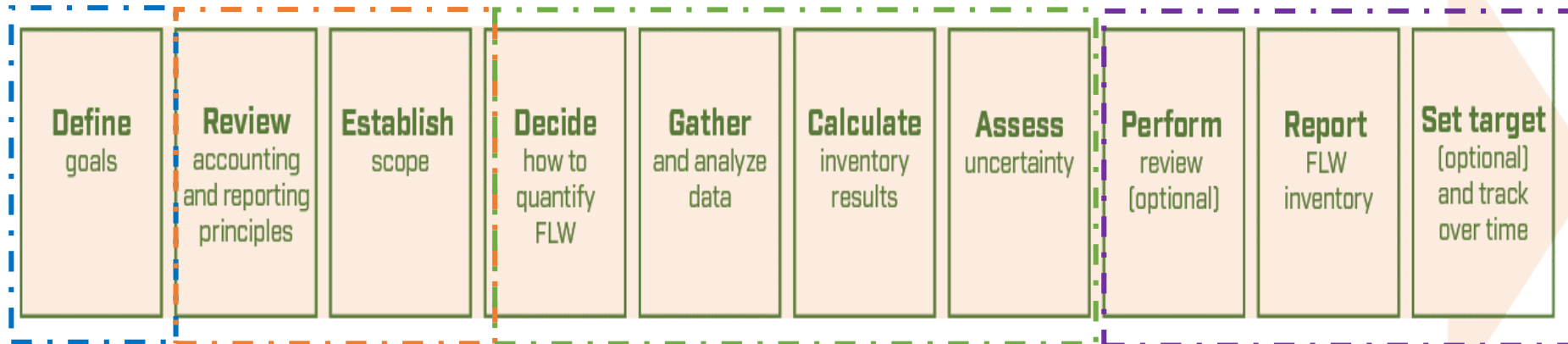
What to quantify?



How to quantify?



Reporting





# An Easy Way to Find Guidance in the FLW Standard

[Why Measure?](#)[FLW Standard ▾](#)[News & Updates](#)[About the FLW](#)

## Download & Explore the FLW Standard

### PART I OVERVIEW

Define  
goals

#### 1. INTRODUCTION

- 1.1 Purpose and Vision
- 1.2 The Need for an Accounting and Reporting Standard
- 1.3 How the Standard Can be Used
- 1.4 Guiding Principles and Design of the Standard

#### 2. DEFINITION OF TERMS AND APPLICATIONS

- 2.1 Standard Terminology: Shall, Should, and May
- 2.2 Material Types and Possible Destinations
- 2.3 Definitions of “Loss and Waste”
- 2.4 How the Standard Addresses the Environmental, Nutritional, or Financial Implications of FLW
- 2.5 How the Standard Applies to Certain Components of the

Review  
accounting  
and reporting  
principles

#### 3. GOALS OF QUANTIFYING FLW

- 3.1 Mandatory and Voluntary Goals
- 3.2 The Implications of Choosing Different Goals

#### 4. SUMMARY OF STEPS AND REQUIREMENTS

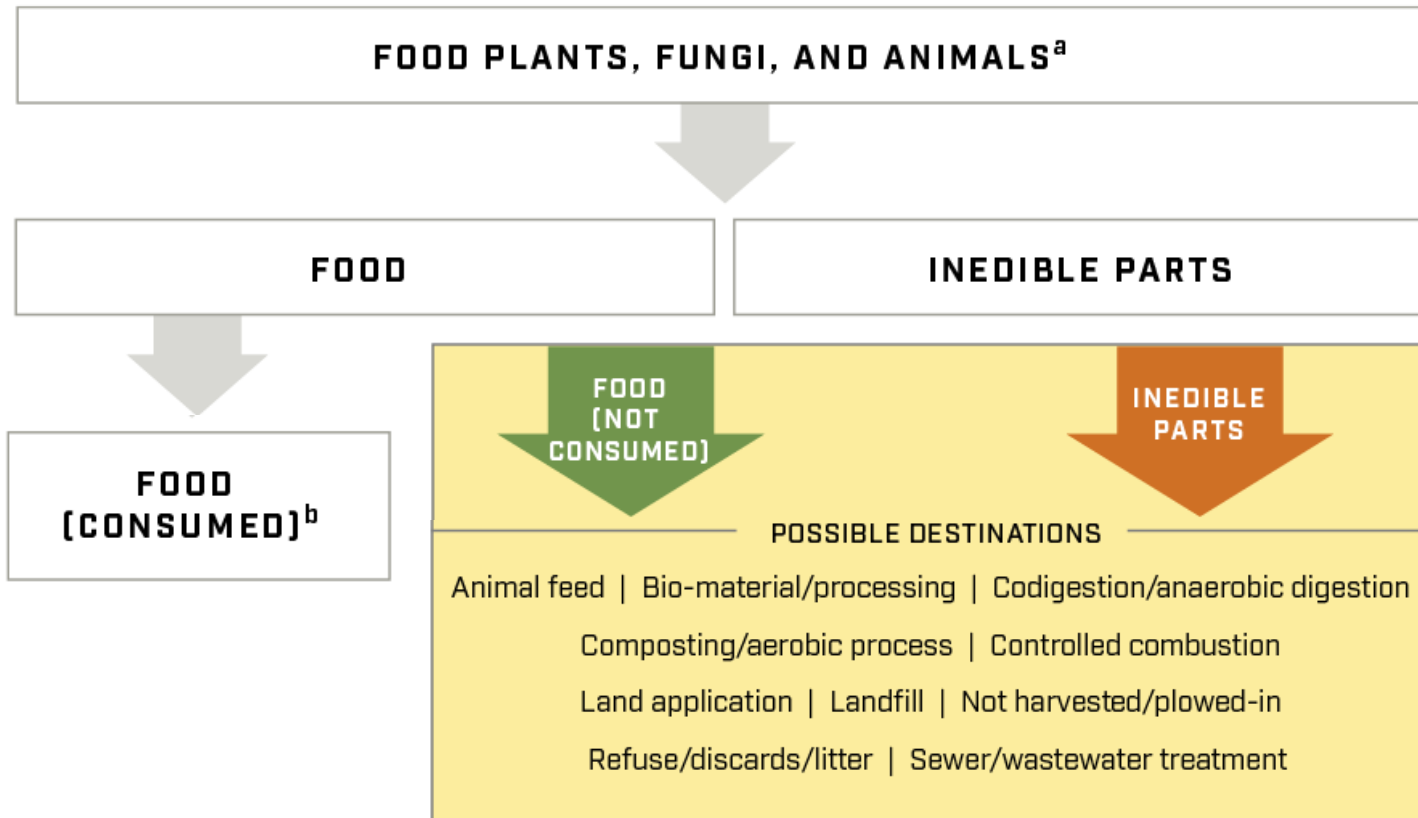
- 4.1 Accounting and Reporting Steps
- 4.2 Summary of Requirements

#### 5. PRINCIPLES OF FLW ACCOUNTING AND REPORTING

- 5.1 Explanation of the Principles and Guidance on Their Application
- 5.2 Guidance: Disclosing and Justifying Exclusions

# Clearly Describe What Is Quantified

Establish  
scope



(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)

The *FLW Standard's* accounting and reporting requirements and guidance apply to that which is in this shaded box (i.e., removed from the food supply chain)

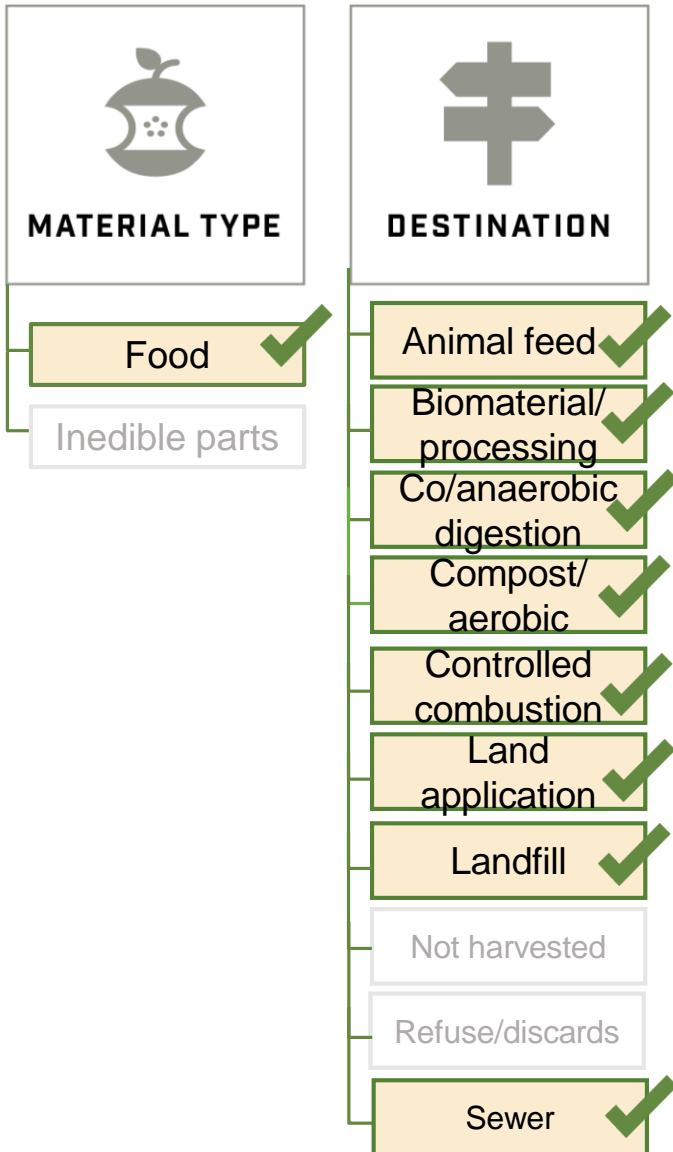
<sup>a</sup> Intended for human consumption (i.e., excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use)

<sup>b</sup> At some point in the food supply chain (including surplus food redistributed to people and consumed)



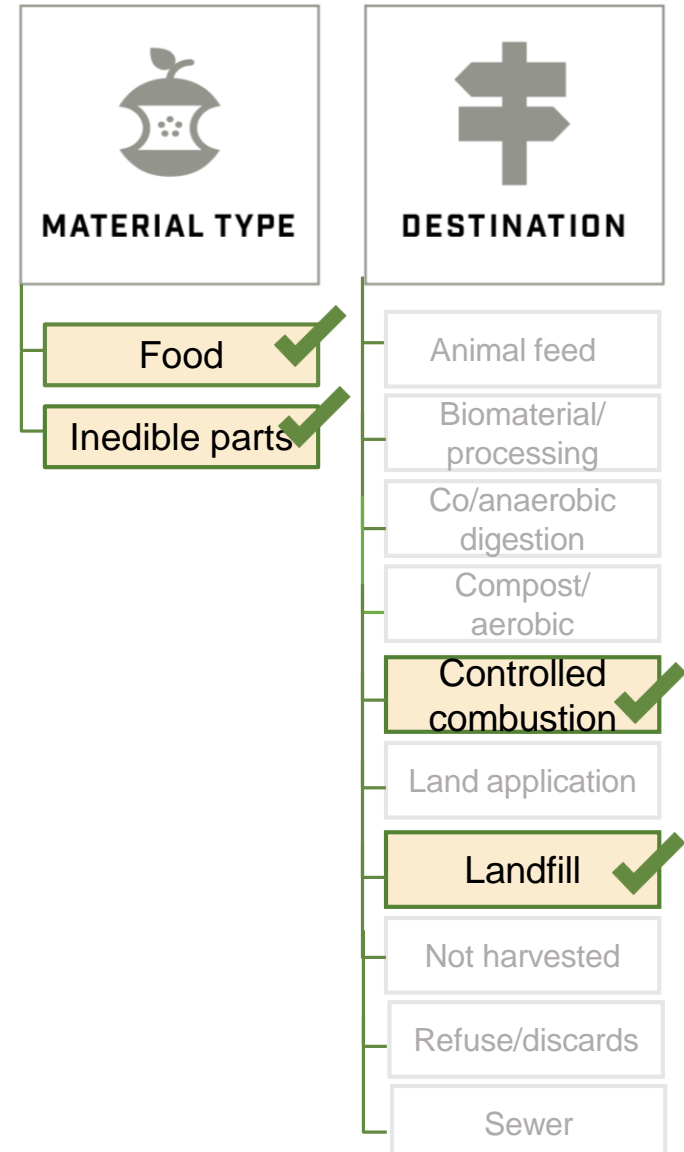
# Example of Different Scopes

USDA: 66.5 million tons







V  
E  
R  
S  
U  
S

US EPA: 36.46 million tons *disposed*



See [FurtherWithFood.org](http://FurtherWithFood.org) for additional details

# Template to Visually Represent Scope Using *FLW Standard*

 TIMEFRAME	 MATERIAL TYPE	 DESTINATION	 BOUNDARY	RELATED ISSUES
(insert timeframe)	<div>Food</div> <div>Inedible parts</div>	<div>Animal Feed</div> <div>Biomaterial/ processing</div> <div>Co/anaerobic digestion</div> <div>Compost/aerobic</div> <div>Controlled combustion</div> <div>Land application</div> <div>Landfill</div> <div>Not harvested</div> <div>Refuse/discards</div> <div>Sewer</div>	<div>Food category = (insert text)</div> <div>Lifecycle stage = (insert text)</div> <div>Geography = (insert text)</div> <div>Organization = (insert text)</div>	<div>Pre-harvest losses and the weight of product packaging is excluded from the weight of FLW.</div> <div>(modify and/or insert additional relevant text)</div>

This template should be customized to show your scope

Indicate what material types and destinations are included as the scope – color in the box and add a check mark ✓

# Where to Find the Customizable Visual



We've created a number of tools and resources to help you use the **FLW Standard**. You can download below the following:

- Guidance on quantification methods
- A summary of the requirements in the FLW Standard
- A sample reporting form
- A customizable visual to summarize the scope of an FLW inventory
- Key terms and definitions used in the FLW Standard

# Where to Find Key Definitions



We've created a number of tools and resources to help you use the **FLW Standard**. You can download below the following:

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Standard.

Why Measure?

FLW Standard ▾

News & Updates

About the FLW Protocol

DEC 13, 2017

10:00 TO 11:00 AM EST

Case Studies

Tools & Resources

Trainings

FAQs

## VIDEO TUTORIALS

These short 3- to 5-minute tutorials include:

- > An introduction to why and how the FLW Standard was created
- > How to describe the scope of a food loss and waste inventory
- > An overview of the possible destinations for food loss and waste
- > Ten of the most common food loss and waste quantification methods

### FLW Standard Introduction



# An Easy Way to Find Guidance in the FLW Standard

[Why Measure?](#)[FLW Standard ▾](#)[News & Updates](#)[About the FLW](#)

## Download & Explore the FLW Standard

**Establish**  
scope

# PART II MAIN REQUIREMENTS

### 6. ESTABLISHING THE SCOPE OF AN FLW INVENTORY

- 6.1 Guide to Chapter 6
- 6.2 Defining the Scope of an FLW Inventory
- 6.3 Timeframe
- 6.4 Material Type
- 6.5 Destination

6.6 Boundary

6.7 Related Issues

6.8 The Influence of Goals

**Decide**  
how to  
quantify  
FLW

### 7. DECIDING HOW TO QUANTIFY FLW

- 7.1 Selecting a Method for Quantifying FLW
- 7.2 Overview of Quantification Methods

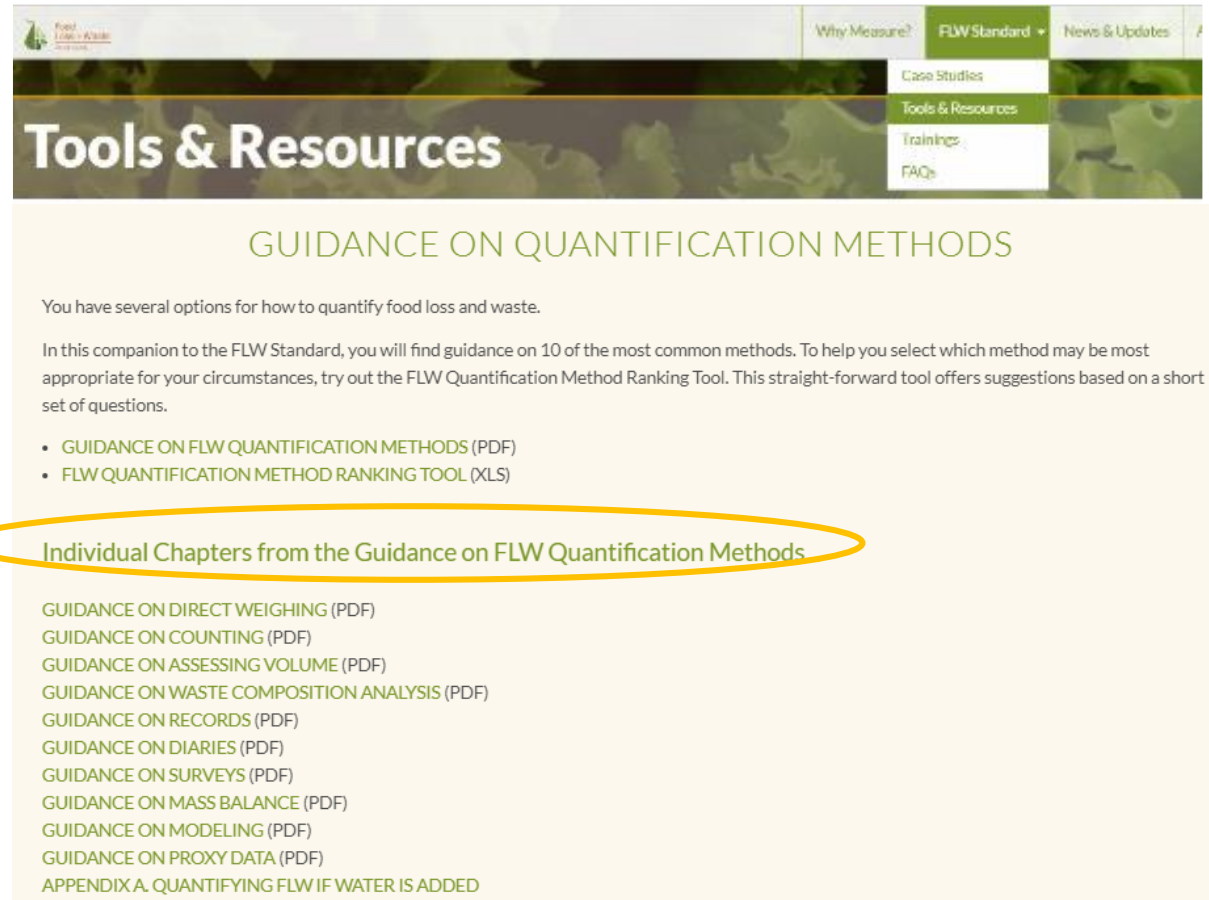
TIP: Hover over each box to see the table of contents; clicking on the Section of interest will take you right to that part of the FLW Standard



# Guidance on Quantification Methods

The *FLW Standard* does not require use of a particular quantification method – but provides an overview of 10 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
- + Quantifying FLW if water is added (Appendix A)



The screenshot shows the 'Tools & Resources' section of the FLW Protocol website. The page has a green header with navigation links: 'Why Measure?', 'FLW Standard', and 'News & Updates'. Below the header is a large green banner with the text 'Tools & Resources'. The main content area is titled 'GUIDANCE ON QUANTIFICATION METHODS' and contains the following text:

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 straight-forward tool offers suggestions based on a short set of questions.

- [GUIDANCE ON FLW QUANTIFICATION METHODS \(PDF\)](#)
- [FLW QUANTIFICATION METHOD RANKING TOOL \(XLS\)](#)

**Individual Chapters from the Guidance on FLW Quantification Methods**

- [GUIDANCE ON DIRECT WEIGHING \(PDF\)](#)
- [GUIDANCE ON COUNTING \(PDF\)](#)
- [GUIDANCE ON ASSESSING VOLUME \(PDF\)](#)
- [GUIDANCE ON WASTE COMPOSITION ANALYSIS \(PDF\)](#)
- [GUIDANCE ON RECORDS \(PDF\)](#)
- [GUIDANCE ON DIARIES \(PDF\)](#)
- [GUIDANCE ON SURVEYS \(PDF\)](#)
- [GUIDANCE ON MASS BALANCE \(PDF\)](#)
- [GUIDANCE ON MODELING \(PDF\)](#)
- [GUIDANCE ON PROXY DATA \(PDF\)](#)
- [APPENDIX A. QUANTIFYING FLW IF WATER IS ADDED](#)

Download individual chapters with tips on using each method  
@ [www.FLWProtocol.org](http://www.FLWProtocol.org)

# FLW Quantification Method Ranking Tool



## 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

Please select answers from drop-down menus

- 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, non-organic 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)?

Placeholder for drop-down menus for questions 1 through 8.

Please provide answer for question 1  
Please provide answer for question 2  
Please provide answer for question 3  
Please provide answer for question 4  
Please provide answer for question 5  
Please provide answer for question 6  
Please provide answer for question 7  
Please provide answer for question 8

Questionnaire

Results

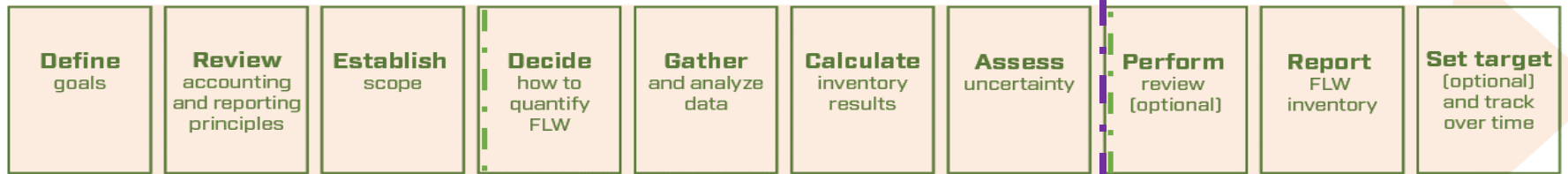
Methodology



# An Easy Way to Find Guidance in the FLW Standard

## How to quantify?

## Reporting



### 8. COLLECTING, CALCULATING, AND ANALYZING DATA

- 8.1 Sampling and Scaling up Data
- 8.2 Quantifying Material Types (Food and Associated Inedible Parts) Separately
- 8.3 Accounting for Packaging
- 8.4 Analyzing FLW Data across Multiple Stages in a Food Supply Chain
- 8.5 Confidentiality Considerations

### 9. ASSESSING UNCERTAINTY

- 9.1 Reporting Degree of Uncertainty
- 9.2 Qualitative Descriptions
- 9.3 Quantitative Assessments
- 9.4 Considerations when Communicating Results

### 10. COORDINATING THE ANALYSIS OF MULTIPLE FLW INVENTORIES

- 10.1 Activities and Goals of Coordinating Entities

### 11. RECORDING CAUSES OF FLW

- 11.1 Identifying Causes
- 11.2 Identifying Drivers
- 11.3 How to Record and Report Causes and Drivers

### 12. REVIEW AND ASSURANCE

- 12.1 Key Terms in Assurance
- 12.2 The Assurance Process

### 13. REPORTING

- 13.1 Guidance on Reporting
- 13.2 Required Information
- 13.3 Optional Reporting

### 14. SETTING TARGETS AND TRACKING CHANGES OVER TIME

- 14.1 Selecting a Base Year
- 14.2 Identifying the Scope of the Target
- 14.3 Choosing a Target
- 14.4 Monitoring Performance Against Targets

TIP: Hover over each box to see the table of contents; clicking on the Section of interest will take you right to that part of the FLW Standard

# Reporting Tools



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- Key terms and definitions used in the FLW Standard

# FLW Standard Accounting and Reporting Requirements

## Report FLW inventory

- 1. Base FLW accounting and reporting on the principles of relevance, completeness, consistency, transparency, and accuracy**
- 2. Account for and report the physical amount of FLW expressed as weight**
- 3. Define and report on the scope of the FLW inventory**
  - a. Timeframe
  - b. Material type
  - c. Destination
  - d. Boundary
- 4. Describe the quantification method(s) used.**
5. If sampling and scaling of data are undertaken, describe the approach and calculation used, as well as the period of time over which sample data are collected
- 6. Provide a qualitative description and/or quantitative assessment of the uncertainty around FLW inventory results**
7. If assurance of the FLW inventory is undertaken (which may include peer review, verification, validation, quality assurance, quality control, and audit), create an assurance statement
8. If tracking the amount of FLW and/or setting an FLW reduction target, select a base year, identify the scope of the target, and recalculate the base year FLW inventory when necessary

# Sample Inventory Reporting Template for *FLW Standard*

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**Food Loss + Waste**  
 PROTOCOL

**FLW STANDARD INVENTORY REPORTING TEMPLATE**  
 (June 2016)

**About this template:**

- This template helps users record and report the results of inventories conducted using the *Food Loss and Waste Accounting and Reporting Standard (FLW Standard)*, Version 1.0.
- It includes items an entity is required to report to be in conformance with the *FLW Standard*.
- Other items are recommended in the standard but not all are included in this template since they are not required (for further details see Chapter 13 of the *FLW Standard*). Those included are marked as "optional" in the template and shaded in gold.
- This is a sample reporting form. An entity may use any format to report FLW provided it contains all the reporting requirements (see Table 4.1 in the *FLW Standard*). An entity may also modify this template to suit its needs.

**Steps for completing this template:**

1. Enable macros. (Click the "Enable Content" button at the top of the screen when you first open the Excel file.)
2. Click the button below to start with Tab I (General information) then go to the other tabs in sequence. Answer the questions in each tab that apply to your situation. Depending on how questions are answered, other questions or fields may become
3. Review the green boxes included on each tab as they contain reference information that will be helpful in completing the
4. For each question in each tab, fill out the box with text or a number, check a box, or select a choice from a drop-down menu, as required by the question.
5. Keep in mind that Tabs V through VIII will not apply to all inventories. Consult the *FLW Standard* for more guidance on when these tabs should be used.
6. When finished entering information into Tabs I through VIII, go to the Summary tab to display the high-level inventory results. At the bottom of the Summary tab is a button that helps you check the inventory for completeness.

**The tabs are organized to report about:**

- I. General information
- II. FLW inventory scope and results
- III. Quantification methods and data sources

**CLICK HERE TO START**  
 (Go to Tab I - General information)

**Legend (cell colors):**

- Required field
- Optional field

Introduction

Summary

I. General info

II. Scope and results

III. Methods-data sources

IV. Da ...



# Additional Tools & Resources Available

# An Easy Way to Find Guidance in the FLW Standard

[Why Measure?](#)[FLW Standard ▾](#)[News & Updates](#)[About the FLW](#)

## APPENDICES

### APPENDIX A. APPROACHES TO SAMPLING AND SCALING UP DATA

A1 Introduction

A2 Guidance on Sampling

A3 Guidance on Scaling up Data

### APPENDIX B. SEPARATING MATERIAL TYPES: DATA SOURCES FOR CONVERSION FACTORS APPLIED TO INDIVIDUAL ITEMS

B1 Introduction

B2 Choosing a Data Source for Conversion Factors

B3 General Sources of Data for Conversion

### APPENDIX D. EXPRESSING WEIGHT OF FLW IN OTHER TERMS OR UNITS OF MEASUREMENT

D1 Introduction

D2 General Considerations

D3 Environmental Impacts

D4 Nutritional Content

D5 Financial Implications

### APPENDIX E. QUANTIFYING AND REPORTING THE WEIGHT OF FOOD RESCUED

E1 Introduction

E2 Steps for Quantifying the Weight of Food

TIP: Hover over each box to see the table of contents; clicking on the Section of interest will take you right to that part of the FLW Standard

# FAQs

## About the FLW Standard

What does the FLW Standard help me do?

+

What's the benefit of using the FLW Standard?

+

Who can use the FLW Standard?

+

Why should I measure food loss and waste?

+

Who is using the FLW Standard?

+

## Defining Food Loss and Waste

Does the FLW Standard prescribe a particular definition for "food loss and waste" (FLW)?

+

How does the FLW Standard define "food"? How does it define "inedible parts"?

+

What are the different destinations I can use to describe "loss and waste"?

+

Does the FLW Standard apply to food rescued and secondary markets for food?

+

# FAQs (continued)

## How to Implement the FLW Standard

How do I get started?	+
What requirements do I need to meet to be in conformance with the FLW Standard?	+
Where can I get help using the FLW Standard?	+

## How to Measure and Report a Food Loss and Waste Inventory

How do I measure food loss and waste?	+
What if I want to express the weight of food loss and waste in other terms (e.g., environmental impact, nutritional content, or financial implications)?	+
How do I report my food loss and waste inventory?	+
How do I verify my food loss and waste inventory?	+
How does the Standard take into account related issues like the weight of packaging or water added (e.g., during cleaning)?	+



# The Business Case for Reducing Food Loss and Waste



## THE BUSINESS CASE FOR REDUCING FOOD LOSS AND WASTE

A report on behalf of Champions 12.3



### SUMMARY

According to available estimates, approximately one-third of all food produced in the world intended for human consumption is lost or wasted. This level of inefficiency in the global food system has significant economic, social, and environmental impacts. It amounts to economic losses of \$492 billion per year. It means that more than a billion tons of food never gets consumed each year, while one in nine people remain undernourished. In addition, food loss and waste is responsible for an estimated 8 percent of annual greenhouse gas emissions; if it were a country, food loss and waste would be the third-largest emitter after China and the United States.

Reducing food loss and waste therefore can generate a triple win for the economy, for food security, and for the environment. But why is food loss and waste reduction not already being implemented at sufficient scale by countries, cities, and companies? Interviews with public and private sector decision-makers indicate that one reason is many leaders may not be aware—or may not believe—that there is a solid “business case” for reducing food loss and waste. For instance, the associated costs of food loss and waste may be buried in operational budgets, accepted as the “cost of doing business,” or considered not worth the investment needed to achieve reductions.

Our analysis of historical data indicates, however, that there is a robust business case for countries, cities, and companies to reduce food loss and waste. Consider the United Kingdom (UK). In 2007, the country launched a nationwide initiative to reduce household food waste. By 2012, it had achieved an outstanding 15 percent reduction in household food waste relative to 2007 levels. The ratio of purely financial benefits to financial costs attributable to the UK initiative was more than eight-to-one in its very substantial return on investment. In other words, every £1 invested in efforts to catalyze household food waste reduction resulted in savings of £8.60.

### ABOUT THIS PUBLICATION

Prepared on behalf of Champions 12.3, *The Business Case for Reducing Food Loss and Waste* analyzes the financial impacts of historical food loss and waste-reduction efforts conducted by a country, a city, and numerous companies. The results show that the financial benefits of taking action often significantly outweigh the costs. This publication also identifies a number of complementary strategic benefits of reducing food loss and waste. It concludes by outlining how governments and companies can embark on reduction efforts.

### AUTHORS

This publication was prepared by Emily Pearson (Global Director of Food, Farms, and Waste at WFP) and Peter Winchell (Head of Economics, WFP).

The authors thank Champions 12.3 and their associates for reviewing and providing helpful input on draft versions of this publication (see Acknowledgments).

Research from 1,200 business sites across 700 companies in 17 countries found that the median company saved \$14 for every \$1 they invested in curbing food loss and waste.

Data from the United Kingdom and the city of London show similarly large returns.

[Download the Champions 12.3 Report](#)

# Lessons Learned | Practical Examples



- ✓ Benefits from using the FLW Standard
- ✓ Challenges faced and overcome in measuring
- ✓ How to summarize an FLW inventory using the FLW Standard
- ✓ Actions being taken to reduce FLW

TESCO'S OPERATIONS IN THE UNITED KINGDOM:  
FOOD WASTE IN STORES AND DEPOTS

*A Case Study*



KELLOGG COMPANY: FOOD WASTE IN  
GLOBAL MANUFACTURING OPERATIONS

*A Case Study*



DELHAIZE AMERICA'S OPERATIONS IN  
THE UNITED STATES: FOOD WASTE IN STORES  
AND DISTRIBUTION CENTERS

*A Case Study*



NESTLÉ DAIRY FACTORIES IN PAKISTAN:  
LOSSES ACROSS THE VALUE CHAIN

*A Case Study*



## More in the Pipeline:

Cranswick plc, Danone, Campbell's,  
Sobey's, Walmart

FOOD WASTE IN CITIES: NRDC REPORT USING FLW  
STANDARD (SEE APPENDIX A AND B)





## Next Steps

- ✓ Sectoral guidance and other tools under development
- ✓ Monthly webinar series to continue January 17<sup>th</sup> (third Wednesdays)
  - Send us your thoughts on questions and topics to address
- ✓ If you aren't already signed up for the news update, do so at the bottom of any page @ [FLWProtocol.org](http://FLWProtocol.org)

**STAY IN TOUCH AND INFORMED**

Sign up to stay updated on the latest FLW news, case studies, tools, and training events.

*First Name	*Last Name	*Email
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Company	Job Title	City
<input type="text"/>	<input type="text"/>	<input type="text"/>
State	*Country	
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Part 2.

Open Question & Answer



# Acknowledgements | Funders of WRI's FLW Initiative



Ministry of Economic Affairs

*The Netherlands Ministry of Economic Affairs*



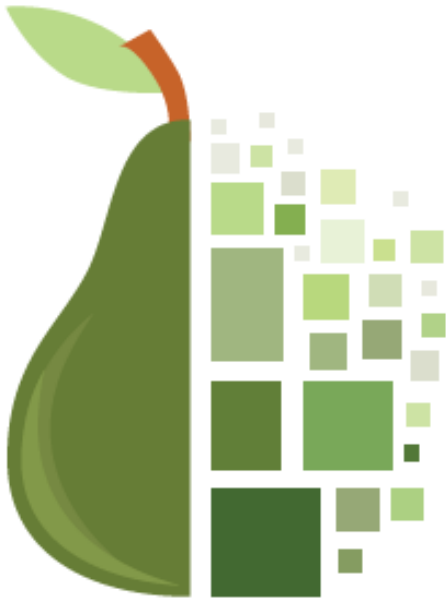
Ministry of Foreign Affairs of the  
Netherlands

MINISTRY OF FOREIGN AFFAIRS OF DENMARK  
**DANIDA** | INTERNATIONAL  
DEVELOPMENT COOPERATION



*Note:* The Ministry of Foreign Affairs of the Netherlands, the Royal Danish Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency (SIDA) and the Department of Foreign Affairs and Trade of Ireland (Irish Aid) provided core funding of the World Resources Institute, which made possible the development of the Food Loss and Waste Protocol.

Contact Us With Questions



# Food Loss + Waste

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## PROTOCOL

[www.flwprotocol.org](http://www.flwprotocol.org)

For questions and suggestions, contact:  
Kai Robertson (robertson.kai@gmail.com)  
Brian Lipinski (blipinski@wri.org)  
Craig Hanson (chanson@wri.org)

# APPENDIX



# FLW STANDARD ACCOUNTING AND REPORTING REQUIREMENTS

**1. Base FLW accounting and reporting on the principles of relevance, completeness, consistency, transparency, and accuracy**

**2. Account for and report the physical amount of FLW expressed as weight (e.g., pounds, kilograms, tons, metric tons)**

**3. Define and report on the scope of the FLW inventory**

a. *Timeframe*. Report the timeframe for which the inventory results are being reported (including starting and ending date)

b. *Material type*. Account for and report the material type(s) included in the FLW inventory (i.e., food only, inedible parts only, or food and associated inedible parts).

If food or associated inedible parts removed from the food supply chain are accounted for separately in the inventory:

- Describe the sources or frameworks used to categorize a material as food or as inedible parts. This includes stating any assumptions that were used to define whether or not material was “intended” for human consumption
- Describe the approach used to calculate the separate amounts. If applicable, describe all conversion factors used and their sources

c. *Destination*. Account for and report the destinations included in the FLW inventory (i.e., where material removed from the food supply chain is directed). If the destination is unknown, then report the initial path(s) at a minimum.

d. *Boundary*. Report the boundary of the FLW inventory in terms of the food category, lifecycle stage, geography, and organization (including the sources used to classify them).

e. *Related issues*.

Packaging and other non-FLW material. Exclude from an FLW inventory any material (and its weight) that is not food or associated inedible parts removed from the food supply chain (i.e., FLW). If a calculation is needed to separate the weight of FLW from non-FLW materials (e.g., subtracting the weight of packaging), describe the approach and calculation used

Water added/removed from FLW. Account for and report the weight of FLW that reflects the state in which it was generated before water was added, or before the intrinsic water weight of FLW was reduced. If a calculation is made to estimate the original weight of FLW, describe the approach and calculation used

Pre-harvest losses. Exclude pre-harvest losses from the scope of an FLW inventory. Users may quantify such losses but shall keep data separate from the FLW inventory results

**4. Describe the quantification method(s) used. If existing studies or data are used, identify the source and scope**

**5. If sampling and scaling of data are undertaken, describe the approach and calculation used, as well as the period of time over which sample data are collected (including starting and ending dates)**

**6. Provide a qualitative description and/or quantitative assessment of the uncertainty around FLW inventory results**

**7. If assurance of the FLW inventory is undertaken (which may include peer review, verification, validation, quality assurance, quality control, and audit), create an assurance statement**

**8. If tracking the amount of FLW and/or setting an FLW reduction target, select a base year, identify the scope of the target, and recalculate the base year FLW inventory when necessary**

# DEFINITION: *MATERIAL TYPES*

## Defining Food and Inedible Parts

**Food:**<sup>a</sup> Any substance—whether processed, semi-processed, or raw—that is intended for human consumption. “Food” includes drink, and any substance that has been used in the manufacture, preparation, or treatment of food. “Food” also includes material that has spoiled and is therefore no longer fit for human consumption. It does not include cosmetics, tobacco, or substances used only as drugs. It does not include processing agents used along the food supply chain, for example, water to clean or cook raw materials in factories or at home.

**Inedible parts:** Components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, rinds, and pits/stones. “Inedible parts” do not include packaging. What is considered inedible varies among users (e.g., chicken feet are consumed in some food supply chains but not others), changes over time, and is influenced by a range of variables including culture, socio-economic factors, availability, price, technological advances, international trade, and geography.

<sup>a</sup>Adapted from Codex Alimentarius Commission (2013)

## DEFINITION: *DESTINATIONS*

Destination	Definition
<b>Animal feed</b>	Diverting material from the food supply chain <sup>a</sup> (directly or after processing) to animals
<b>Bio-based materials/biochemical processing</b>	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
<b>Codigestion/anaerobic digestion</b>	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)
<b>Composting/aerobic processes</b>	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
<b>Controlled combustion</b>	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)
<b>Land application</b>	Spreading, spraying, injecting, or incorporating organic material onto or below the surface of the land to enhance soil quality
<b>Landfill</b>	Sending material to an area of land or an excavated site that is specifically designed and built to receive wastes
<b>Not harvested/plowed-in</b>	Leaving crops that were ready for harvest in the field or tilling them into the soil
<b>Refuse/discards/litter</b>	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)
<b>Sewer/wastewater treatment</b>	Sending material down the sewer (with or without prior treatment), including that which may go to a facility designed to treat wastewater
<b>Other</b>	Sending material to a destination that is different from the 10 listed above. This destination should be described

<sup>a</sup> Excludes crops intentionally grown for bioenergy, animal feed, seed, or industrial use

## DEFINITION: *BOUNDARY*

Boundary dimension	Definition	Examples
Food category	The type(s) of food included in reported FLW	<ul style="list-style-type: none"><li>• All food</li><li>• Dairy products</li><li>• Fresh fruits and vegetables</li><li>• Chicken</li></ul>
Lifecycle stage	The stage(s) in the food supply chain or food lifecycle within which reported FLW occurs	<ul style="list-style-type: none"><li>• Entire food supply chain</li><li>• Two stages: manufacture of dairy products, and retail of food and beverage</li><li>• At home</li></ul>
Geography	Geographic borders within which reported FLW occurs	<ul style="list-style-type: none"><li>• World (all countries)</li><li>• Eastern Asia</li><li>• Ghana</li><li>• Nova Scotia, Canada</li><li>• Lima, Peru</li></ul>
Organization	Organizational unit(s) within which reported FLW occurs	<ul style="list-style-type: none"><li>• All sectors in country</li><li>• Entire company</li><li>• Two business units</li><li>• All 1,000 stores</li><li>• 100 households</li></ul>

# BOUNDARY (Classification sources to use)

Boundary dimension	Classification source to use (select the most current version)	Selected examples with relevant codes
Food category	<ul style="list-style-type: none"> <li>Select one or more categories from either the <a href="#">Codex General Standard for Food Additives (GSFA)</a> system or United Nations <a href="#">Central Production Classification (CPC)</a> system</li> <li>If more detailed information is used, include appropriate codes from more granular sources including: <ul style="list-style-type: none"> <li><a href="#">Global Product Category (GPC) codes</a> (online, or <a href="#">download an Excel, Word or XML copy</a>)</li> <li><a href="#">United Nations Standard Products and Services Code (UNSPSC)</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>All food (GSFA 01.0 –16.0) or (CPC2.1 Divisions 21–24)</li> <li>Dairy products (GSFA 01.0) or (CPC2.1 Group 221 &amp; 222)</li> <li>Fresh fruits and vegetables (GSFA 04.1 &amp; 04.2.1) or (CPC2.1 Group 012 &amp; 013)</li> <li>Chicken (GSFA 08.1.1 [Fresh meat, poultry, and game, whole pieces or cuts]; GPC Brick 10005769) or (CPC2.1 Subclass 21121)</li> </ul>
Lifecycle stage	<ul style="list-style-type: none"> <li>Select one or more United Nations <a href="#">International Standard Industrial Classifications of All Economic Activities (ISIC) codes</a> (At the time of publication, the latest version is “Rev.4”)</li> <li>Regional and national classification systems may be used as well, most of which are derived from the ISIC (e.g., NACE for Europe). The UN Statistics Division lists <a href="#">national classification systems</a></li> <li>If no code exists, write in the lifecycle stage</li> </ul>	<ul style="list-style-type: none"> <li>Entire food supply chain (select relevant group of ISIC codes)</li> <li>Two stages: manufacture of dairy products (ISIC Group: 105) and retail of food and beverage (ISIC Class: 4721)</li> <li>At home (ISIC Class: 9820)</li> </ul>
Geography	<ul style="list-style-type: none"> <li>Select one or more <a href="#">UN regions or country codes</a></li> <li>Write in description for narrower geographic scope. Where available, use a national classification system (e.g., U.S. Census)</li> </ul>	<ul style="list-style-type: none"> <li>World/all countries (UN Code 001)</li> <li>Eastern Asia (UN Code 030)</li> <li>Ghana (UN Code 288)</li> <li>Nova Scotia, Canada</li> <li>Lima, Peru</li> </ul>
Organization	<ul style="list-style-type: none"> <li>Write in number and type of unit(s) and any additional descriptive detail</li> </ul>	<ul style="list-style-type: none"> <li>All sectors in country</li> <li>Entire company</li> <li>Two business units</li> <li>All 1,000 stores</li> <li>100 households</li> </ul>