Food Loss and Waste
Standard – Use in Monitoring Food Waste to Meet EU Reporting Obligations

Andrew Parry (Special Advisor, WRAP)

Kai Robertson (Lead Advisor, FLW Protocol, WRI)

28th February 2018
Topics covered

- Brief background on origins of the Food Loss and Waste Standard (FLWS)
- What is the FLWS, and what are its advantages
- FLWS requirements vs flexibility (and how this can be tailored to align to the requirements of the CEP)
- Where is the FLWS being used
- How the FLWS can be used to aid national reporting
- Guidance/tools/support that is available now, and under development
- Summary
- Discussion
Origin of the FLWS

A Steering Committee of seven expert institutions providing technical input, written content, strategic direction, and quality control.

STEERING COMMITTEE

Secretariat:
Multi-stakeholder involvement

Over 200 stakeholders consulted

Recognitions

The FLW Protocol is grateful for the in-kind contributions of the many individuals who shared their feedback and insights.

Across every continent
Across the food supply chain
Across all types of organizations (academia, private sector, government, NGOs)
What is the FLWS

The FLWS is:

- A **voluntary, global** accounting and reporting standard
- For quantifying and reporting on the **amount** of food and/or associated inedible parts removed from the food supply chain (*referred to for simplicity sake as ‘food loss and waste,’ or FLW*)
- Intended for a **wide range** of entities - countries, companies and other organizations

[The Food Loss & Waste *Protocol* is the multi-stakeholder effort that developed the FLWS]
Does not dictate what methods should be used to acquire the food waste data (but provides guidance on this)
What is the FLWS
(resources @ www.FLWProtocol.org)
What is the FLWS

- Aims to support users in:
  - Understanding why to measure FLW
  - What to measure
  - How to approach measurement
  - How to report

- Provides:
  - Consistent language
  - Framework for consistent and transparent reporting
Requirements vs flexibility
Does not dictate what is classed as food waste (but provides an adaptable template for users to show what is being included)

[Taken from draft ‘Monitoring of food waste – outline to methodology’]
FLWS vs FUSIONS guidance

Guidance on possible methods

Table of Contents

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
APPENDIX A. QUANTIFYING FLW IF WATER IS ADDED
REFERENCES
ENDNOTES

Recommended approach

63 FUSIONS
Food waste quantification manual to monitor food waste amounts and progress

74 Recommended approach for Wholesale, Retail and Markets

6.5 Undertaking a study involving new measurements
7.1 Scope and structure of the sector
7.1.1 Definition of wholesale, retail and markets
7.1.2 Mapping of wholesale, retail and market sector
7.1.3 Definition of food waste in the sector
7.2 Identify and review existing data relating to food waste from wholesale, retail and markets
7.2.1 Identify existing data
7.2.2 Review identified data and estimates
7.3 Select approach for sectorial for food waste quantification
7.4 Using existing estimates or raw data
7.5 Undertaking a study involving new measurements
7.5.1 Methods based on direct weighing
7.5.2 Methods based on counting / scanning
7.5.3 Mass balance
7.5.4 Other considerations

Chapters include:
- Overview
- Advantages/disadvantages
- Level of expertise required
- Cost
- Guidance on implementing
FLWS requirements

Note: Three of these requirements are only relevant in some cases (5,7,8)

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
Advantages of the FLWS

✓ Common language
✓ Reporting framework
✓ Practical guidance

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

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

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

---

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)

Scope described using FLW Standard

**Timeframe:** 12 months (Jan. 1 – Dec. 31)

**Material Type:** Food
- Animal feed
- Biomaterial processing
- Co/anaerobic digestion
- Compost/aerobic
- Controlled combustion
- Land application
- Landfill
- Not harvested
- Refuse/discard
- Sewer

**Destination:**
- Food category = All food and beverages
- Lifecycle stage = All (only includes farm-level FLW that’s off site)
- Geography = Entire country
- Organization = All FLW-producing units

**Issues:**
- Pre-harvest losses and the weight of product packaging is excluded from the weight of FLW
Consistency in language

Still food but in a different state!

This is **edible** = fit for human consumption

These are both “food” – originally intended for human consumption

This is **no longer edible (not edible)** = some might call it “inedible”

It’s confusing to refer to “edible” versus “inedible” because there are also… inedible parts
Consistency in language

This is (Inedible) **Food** = no longer edible, i.e., not **fit** for consumption

Avoid confusion and use “food” and “inedible parts”

This is the **Inedible Parts** = bones, rinds, pits/stones not **intended** for consumption
Consistency in definitions / language

- Definition of food – FLWS definition from Codex Alimentarius Commission (2013)
- Inedible parts - cultural element
  [WRAP carried out research to inform what was included in this]
- Food waste – still a variety of terms being used
  - WRAP moving away from avoidable, possibly avoidable and unavoidable, to:
    - Food waste = “wasted food” (elements intended for human consumption) plus “associated inedible parts”
      (This language also used by U.S. environmental agencies)
  - Recommendation not to use ‘edible’ and ‘inedible’ (as can be misinterpreted)
FLWS in practice
Examples of business users

Many companies and other organizations are using the FLW Standard. These case studies share why some are measuring food loss and waste and the benefits of doing so, how they define the scope of their food loss and waste inventory using the FLW Standard, and some of the innovations that are helping them achieve their goals.

More in the Pipeline: Cranswick plc, Danone, Campbell’s, Sobey’s, Walmart
Example of other users

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

- 25 major suppliers representing >£17 billion of sales
- Adopted targets aligned to SDG 12.3 (Champions 12.3 interpretation)
- Will measure and publish food waste data by September 2018
- Reporting template uses the FLWS
- Supported by WRI, Anthesis (Consultancy) and WRAP
- Workshop to discuss details and provide clarification
- Will feed into wider development of new resources
Working with Industry Leaders to agree principles of food waste measurement

- Mandate from the UK Industry Leaders Forum (ca 30 CEOs)
- Collaborative exercise with a range of business representatives to develop a set of principles for how food waste measurement should be approached
- Retail, hospitality & food service, manufacture, primary production
  - Accepted by the Industry Leaders Forum September 2017
- Implementation Roadmap to be developed by September 2018
There are three principles of food waste measurement:

1. Food waste measurement and reduction should focus on farm to fork in pursuit of SDG Target 12.3
2. The framework of Target, Measure, Act represents the best way to make progress on food waste measurement and prevention
3. Consistent definitions of food, food waste and inedible parts, must be adopted by every organisation which commits to measure and reduce food waste

Adopting a common approach to measuring food waste, in line with the Food Loss & Waste Standard and Champions 12.3 clarification document, is essential to make progress.

Supporting these principles consistently across our industry will enable individual companies and industry as a whole to demonstrate congruence in how food waste is being measured and managed.
Food waste measurement signposting tree

Why should I measure food waste? What should I measure? How should I do this? How can I take action to reduce food waste? Answer the questions below and navigate to relevant resources to find out.

Interactive guide - just rollover and click to navigate.

Do you have the resources to start measuring food waste?

- Yes  - No not yet

Do you need some initial data on how much food you are wasting (to help identify hotspots and/or to target measurement)?

- No  - Yes

Consider making use of the 'Your Business Food' resources

Are you clear about what to measure (in line with good practice for your sector)?

- Yes  - Not really

Review the guidance on scope and definitions

Do you need help with how to measure food waste in your business?

- No  - Yes

Revise the guidance on available methods and definitions

Do you need help with how to reduce food waste in your business?

- No  - Yes

Review the relevant guidance and case studies

Contact WRAP to discuss how you can create a case study of your work

email: foodspecialist@wrap.org.uk
Aligning UK household food waste data

WRAP defined this as:
- Avoidable and potentially avoidable
- Unavoidable

Historically WRAP has also included food fed to pets/animals
Aligning UK household food waste data with the FLWS / FUSIONS language

1: Exclusion of 0.3 Mt of food fed to animals

2: Consolidation of three fractions (avoidable, possibly avoidable, unavoidable) into two (food and inedible parts)

[Green = food and red = inedible parts in the final column]
How the FLWS can be used to aid national reporting
FLWS as an aid for transparent national reporting

- Can form part of a strategy for Member States to acquire food waste data from supply chains
  - Ensure scope of data and method used for data generation is clearly reported. Reporting based on FLWS requirements provides clarity with respect to the reliability, consistency, and comparability of the data.
  - Integrate into existing or new reporting mechanisms (e.g. through voluntary agreements, trade body surveys, mandatory requirements etc.)
- Can help ensure Member State-funded research is consistent and comparable (e.g. on household food waste)
FLWS as an aid for transparent national reporting

- Needs to be complemented by:
  - Guidance on what to include in scope (e.g., related to material types, destinations, and boundary)
  - Guidance on methodological approaches
  - Tailored reporting template(s)

- Supplementary sector-level guidance / Q&As may be needed (and may be covered by future FLWS resources)

- Training / sector-level discussions are invaluable
**Example reporting template**

(UK retail suppliers; based on FLWS)

---

**FOOD WASTE INVENTORY BASED ON XXXX RECOMMENDATIONS AND FLW STANDARD REQUIREMENTS**

(see www.FLWProtocol.org for details and guidance)

**SUMMARY**

- **Company name:** Company XYZ
- **Name of person filling out report:** Mary Smith
- **Date submitted:** Month Day, Year

- **Overall food waste tonnage:** 1,000 tonnes
- **Food waste in tonnes as a % of food produced in tonnes:** 10%

**OPTIONAL:**

- Quantitative breakdown of food waste tonnage by key categories (composition of food waste):
  - Breakdown by category is published on Company XYZ’s website
  - Food waste amount by destination: Breakdown by destination is published on Company XYZ’s website
- Tonnes of surplus food donated to charity or other human consumption streams, surplus food / inedible parts diverted to animal feed and/or bio-based materials/biochemical processing:
  - Surplus food: 50 tonnes donated to charity
  - Animal feed: 100 tonnes of surplus food and inedible parts
- Bio-materials processing: 30 tonnes of inedible parts. Breakdown by destination is also published on Company XYZ’s website

---

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

- **Timeframe:** 12 months; November 1, 2016 – October 31, 2017
- **Material type:** Food and associated inedible parts
- **Destination:** While multiple destinations fall under the definition of “food waste” for Company XYZ, food waste in this inventory only goes to anaerobic digestion and sewer/wastewater treatment
- **Boundary:**
  - **Food category:** Baked goods for retail (GSFA04.2; GSFA07.2; GSFA08.1; GSFA15.1)
  - **Lifecycle stage:** ISIC Group 1071 / 1075 Manufacture of bakery goods and prepared meals and dishes
  - **Geography:** United Kingdom, UN Code 826
  - **Organization:** 20 factories
- **Related issues:** Packaging weight is excluded. No separate calculation is needed to separate the weight of packaging from the weight of the food waste since the product weights used to calculate the total weight do not include packaging. The weight of water is excluded from the weight of FLW in calculations to the sewer/wastewater treatment.

---

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

Quantification methods include: direct weighing, records and waste composition analysis. Methodology is published on Company XYZ’s website.

---

**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)**

N/A

---

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

Sources of uncertainty include estimates made about the total mass of food waste to sewer/wastewater treatment

---

**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**

N/A

---

**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**

- **Base year:** 2016
- **Food waste reduction target:** 50% by 2030
- **Methodology:** is in place to determine when baseline recalculation is necessary
Example reporting format
(3 US cities – businesses; based on FLWS)
Example guidance to producers and manufacturers (UK retail supply chain)

Food Waste Recommendations
A Reference Document for Suppliers

Context
This document is intended to help you on your measurement journey by providing a summary of recommendations and optional best practices as well as related guidance.

You'll find answers to the following questions:
1. What are our recommendations?
2. What do I include when developing my food waste baseline?
3. What methods can I use to quantify food waste in my own operations?
4. What do I need to include in my report to XXX?
5. Where can I find more information on measurement and reporting on food waste?

1. What are our recommendations?

The following are our recommendations:
- Clearly defined scope for own operations and timescale (see question 2)
- Report overall food waste tonnage
- Report food waste in tonnes as a % of food produced in tonnes
- Report scope, methods and assumptions in conformance with the FIV Standard

Optional best practice is to include:
- Quantitative breakdown of food waste tonnage by key categories (i.e., composition of food waste)
- Reporting food waste amount by destination
- Reporting amount of surplus food donated to charity or other human consumption streams, surplus food / inedible parts diverted to animal feed or bio-based materials/biochemical processing

2. What do I include when developing my food waste baseline?

The following lays out what we recommend suppliers use as their scope when developing a food waste baseline. This should be reported using the figure on page 5.

a. Timeframe (the period of time for which the food waste data is being reported)

   Recommendation: 12 months

   Guidance: Either calendar or fiscal year is acceptable.

b. Material type (the materials that are included in the food waste inventory [food only, inedible parts only, or both])
Guidance / tools / support
Guidance / tools / support
@ www.FLWProtocol.org
Guidance / tools / support

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. Modelling
10. Proxy data

Plus: Quantifying FLW if water is added

(Appendix A)
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 straight-forward tool offers suggestions based on a short set of questions.

GUIDANCE ON FLW QUANTIFICATION METHODS

Individual Chapters from the Guidance on FLW Quantification Methods

GUIDANCE ON DIRECT WEIGHING
GUIDANCE ON COUNTING
GUIDANCE ON ASSESSING VOLUME
GUIDANCE ON WASTE COMPOSITION ANALYSIS
GUIDANCE ON RECORDS
GUIDANCE ON DIARIES

GUIDANCE ON SURVEYS
GUIDANCE ON MASS BALANCE
GUIDANCE ON MODELING
GUIDANCE ON PROXY DATA
APPENDIX A. QUANTIFYING FLW IF WATER IS ADDED
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)
   - Very important (e.g., setting/monitoring targets)
   - No
   - Yes

2. Is it necessary to determine the reasons why FLW is generated?
   - Yes
   - No

3. Can you get direct access to the FLW being quantified?
   - Yes
   - No

4. Is the FLW (whether packaged or not) mixed with other items or materials (e.g., soil, garden waste, non-organic solid waste, etc.)?
   - Yes, FLW mixed with other material
   - Mainly solid
   - Some
   - No

5. Is the FLW mainly liquid or solid?
   - Yes
   - No

6. Does all, some, or no FLW go down the drain/sewer?
   - Yes
   - No

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)
   - Yes
   - No

8. Is there existing information that describes how FLW varies in response to other factors (e.g., with climate, soil conditions, crop/food types)?
   - Yes
   - No

9. Do you have existing records that could be used for quantifying FLW? (For this purpose, records are individual pieces of data that have been written down or saved often for reasons other than quantifying FLW, e.g., waste transfer receipts or warehouse record books.)
   - Yes
   - No

10. Do you have access to those records? (The response is automatically "not applicable" to this question if the answer is "no" or "don't know" to question 9.)
    - Yes

11. Is a material/significant amount of FLW in its packaging?
    - Yes

Get results

Please note any answers left blank will result in error

Reset questionnaire responses
Guidance / tools / support

Video Tutorials

Food Loss + Waste Protocol
Introduction

Webinars and Slides

Quantifying Food Loss and Waste - Guidance and Methods

In this webinar, we provide guidance for how food loss and waste can be quantified in accordance with the FLW Standard. We also describe factors that may influence your quantification choices and provide an overview of the 10 commonly used quantification methods.

Webinar Slides  Webinar Video
Guidance / tools / support (on measuring)

Being developed for sectors which have specific clarification needs, in collaboration with sector representatives

- Hospitality and food service sector
- Dairy, fresh produce, meat initially
- What material to include, food vs inedible parts, waste in liquid streams etc.
### Describing different streams of purchased food that the business doesn’t use

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does food donated via charities count as food waste?</td>
<td>The FLWS explicitly rules “food rescued” (such as redistribution schemes) out of the scope of food waste. It advises, however, that given the importance of rescuing food, users record the weight of rescued food (separately from their FLW inventory) and provide guidance in Appendix E of the Standard.</td>
</tr>
<tr>
<td>In terms of characterising the “food category” of a food waste stream – what if the stream is heavily mixed – soups, stews, plate scrapings etc.?</td>
<td>The food category can be broadly described (e.g., all food and beverages sold at the operation). However, if more detailed information is available, it is ideal to be more specific in describing the food category so that one inventory can be more easily compared to another. The FLWS recognises that (see pg 51): “For an entity (e.g., a restaurant or retailer) interested in understanding what types of food make up its FLW, the GSFA, CPC, GPC, or UNSPSC codes may not provide sufficient detail [to describe the food category] for items that are composed of multiple ingredients (e.g., prepared meals, soup). In the case of multi-ingredient items, the FLWS recommends an entry describe such items “with a commonly used name (e.g., beef stew)” and “instead of describing all ingredients, it may be more practical for an entity to select the main ingredients that represent a significant proportion of the item's overall weight (e.g., for beef stew this might be beef, broth, onions, and potatoes).”</td>
</tr>
<tr>
<td>How do we account for quantities lost down the drains from cleaning, washing plates and cooking implements etc.?</td>
<td>Firstly, it is important to note that it is only food and drink that should be measured under the FLWS, not cooking or washing water. The FLWS is agnostic about what quantification method is used; however, it requires that whatever method is used is described. You may find it useful to see how the Kellogg Company tackled this in the “Methodology Section” of their case study on the FLWS website: <a href="http://flwprotocol.org/case-studies/">http://flwprotocol.org/case-studies/</a>.</td>
</tr>
<tr>
<td>When measuring how do we categorise mixed food waste from plate scrapings received back in the</td>
<td>With respect to the FLWS, to be transparent in describing your scope, you should record whether or not you include “plate waste” as part of the “lifecycle stage.” Plate waste does not have to be separated into...</td>
</tr>
</tbody>
</table>
Challenging areas – food waste to sewer

- Households – Use of diaries (preferably not combined with investigating other disposal streams)
- Challenging for most other sectors:
  - The exception is the diary sector, where a recommended method has been developed:
    - Record effluent COD load (pre-treatment)
    - Convert into ‘milk equivalents’ (use conversion factor: 1kg COD = 0.223kg milk)
    - Record & report estimate of milk equivalent tonnages
- Effluent volumes, BOD/COD, solids NOT good proxies for food waste in most cases
- Ideally assess volumes prior to dilution/mixing
- More research / practical learnings required (e.g. ZWS)
Challenging areas – food waste in sludge

- ‘Sludge’ waste streams will not be equivalent to the amounts of food in this waste stream – due to dilution and/or concentration (depending on the on-site processing that the food waste may have undergone)
  - % of food in ‘sludge’ varies greatly by sub-sector, from ca. 9% to 60%
- Ideally an estimate of food waste is made prior to any on-site processing and the production of the ‘sludge’
- If this isn’t possible, estimate based on analysis of the process, the sludge, and/or an assessment of the mass flows through the process
- Data on the amounts of sludge containing food waste may be available from the waste contractor, or if applicable, from regulatory returns
- Assumptions about the % of food in sludge fractions should be made clear when reporting food waste data
- Potential approaches are outlined in the FLWS’s Guidance on FLW Quantification Methods (Appendix A) and WRAPs ‘Quantification of food surplus, waste and related materials in the supply chain’
The FLWS was developed through extensive collaboration (with links to FUSIONS)
Increasingly being used by food businesses and others
Supported by Champions 12.3
 Allows flexibility regarding choice of food waste definition (i.e., scope) - but consistent scope needed for monitoring and tracking progress against targets
Does not prescribe methods to obtain data, but does have requirements to ensure consistency and transparency in reporting
Increasing amounts of guidance and support for its use (training, FAQ etc.)
WRI available to advise and happy to receive feedback (FLWS resources are evolving)
Businesses appreciate a harmonised approach

1. **What sectors are covered?** One should interpret Target 12.3 as covering the *entire* food supply chain, from the point that crops and livestock are ready for harvest or slaughter through to the point that they are ready to be ingested by people (Figure 1). Entities should seek to reduce food loss and waste within the boundaries they control, and seek to help drive reductions up and down the supply chains where they have influence.

**Falls within the definition of food waste**
How to learn more

✓ Sectoral guidance and other tools under development

✓ Monthly webinar series (third Wednesdays); prior webinars posed online

✓ If you aren’t already signed up for the news update, do so at the bottom of any page @ FLWProtocol.org
Acknowledgements | Funders of WRI’s FLW Initiative

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.
Discussion

Andrew Parry (Special Advisor, WRAP)
andrew.parry@wrap.org.uk

Kai Robertson (Lead Advisor, FLW Protocol, WRI)
robertson.kai@gmail.com

28th February 2018