Food Surplus and Waste Measurement and Reporting Guidelines: Fresh Produce – September 2018

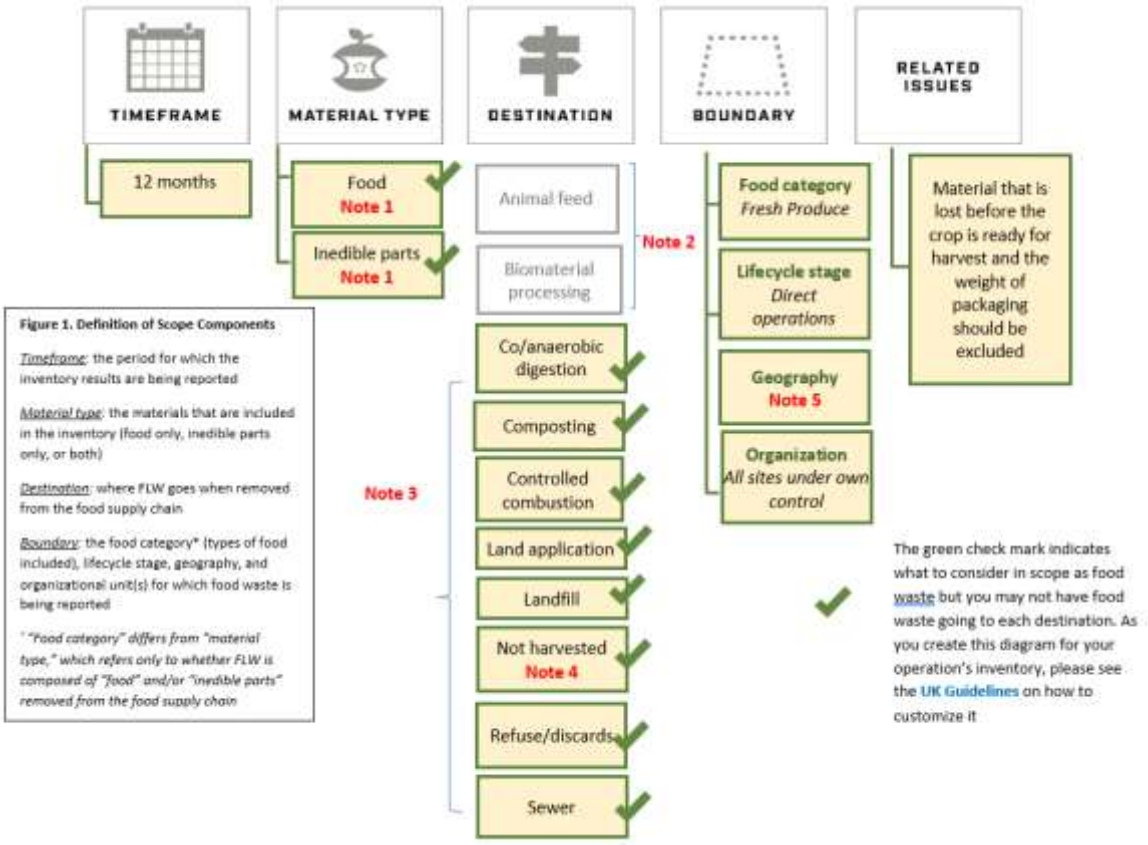
WRAP and UK food businesses have agreed some common guidelines for measuring and reporting on food surplus and waste, consistent with the global Food Loss and Waste Accounting and Reporting Standard (FLW Standard). These have been produced in support of the UK Food Waste Reduction Roadmap – to help the UK meet the Sustainable Development Goal (SDG) 12.3 target to halve food waste by 2030.

The **UK Guidelines, a common Reporting Template and Data Capture Sheet** are available here.

This document should be used in conjunction with the wider UK Guidelines. It provides additional recommendations for fresh produce businesses (growers, packers, processors, service providers), based on the specific operational considerations and challenges relevant to this sector. In addition there are some simplified guidelines that Leaf have developed for growers called 'Food Waste Matters'.

These recommendations will be reviewed annually to ensure that they remain fit-for-purpose. For example, as understanding of primary production wastes and measurement approaches improve.

Figure 1 – Recommended Scope of Food Surplus and Waste Inventory for Fresh Produce



See appendix A for Definitions of 'Food' and 'Inedible parts'

Notes:

1 **Good practice is to report these material types separately if possible, otherwise report both combined. Inedible parts are** *those parts of a plant that an operation has not intended to be for human consumption (e.g., plant stalks, leaves that are not normally eaten). These may be left in the field, removed during harvest, or removed in post- harvest stages. If the inedible parts are reported separately, the operation should describe what they have assumed to be inedible parts.*

See appendix B table showing examples of inedible parts for several crop types

2 **Do NOT include as food waste material sent to animal feed or to bio-based materials/biochemical processing (i.e., where material is converted into industrial products). It is nonetheless useful to record & report material to these destinations separately if possible.**
Animal feed is defined as: "Diverting material from the food supply chain (directly or after processing) to animals.". This would also include where animals graze crops left in field (see FAQ section below)

Biomaterial processing is defined as: "Converting material into industrial products. Examples include creating fibres for packaging material; creating bioplastics (e.g., polylactic acid); rendering 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."

If material is converted into other food-related products (e.g., food flavourings or additives), it is not considered food waste as it remains within the human food supply chain.

NB: Redistribution of food for human consumption is excluded from the scope of food waste however this should be measured and reported separately as it is a food waste prevention activity. This would include where any gleaning is employed (see FAQ section below).

3 **Some destinations may not be relevant – these can be excluded but their exclusion should be made clear when describing your scope. Similarly, if the amount of material to certain destinations is minimal, and you choose to exclude these destinations, state the exclusions when describing your scope.**[1]

4 **"Not harvested" refers to crop that is ready for harvest but has been left in the field or ploughed in. This may include fields (or parts of fields) that were never harvested as well as crop (and its "inedible parts") that was left behind during the harvesting process.**

NB: If the data includes crop that was not ready for harvest, and if this is a significant quantity, include this as context in your description of possible sources of uncertainty.

[1] A company should decide what is included or excluded in their inventory based on the principles described in Chapter 5 of the FLWS, considering whether a certain choice would compromise the principle of "relevance" (i.e., the decision-making needs of the inventory's intended users). For example, if accounting for a certain type of food waste is not feasible due to limitations such as measurability or data availability, the FLWS allows users to exclude it from an inventory, but does require disclosing and justifying any exclusion (note: describing what is included or excluded may be noted in the Boundary under "food category," or as appropriate elsewhere in the inventory report). As an alternative to exclusion a company could approximate the amount of waste, or use proxy data. The assumptions and limitations should then be transparently shared in the inventory report.

5 **Include all geographies where you have direct operations - but this can be where main operations are based (e.g., particular location, or entire country) to begin with as long as this is made clear**

Frequently Asked Questions (*answers in green*)

Boundary (what should my data cover?)

- What should the approach be for different business models (e.g. service provider that doesn't own any pack houses; owned vs non-owned growers; supply chains with a mixture of own growers and external suppliers)?

Processes that are part of the supplier's own operations are to be included in scope. Own operations mean where you have total control of a process and/or ownership of the material.

As noted in the UK guidelines, you would elaborate on the details of what's included in your operation as part of the "boundary." For example, under "lifecycle stage" you would indicate if you're including owned and non-owned growers (or not), and as part of "organization" you would indicate the number of facilities included.

If you are including owned or non-owned operations outside of the UK, then you should be reporting this separately at a country level

Destinations (where is my crop going?)

- Why is sending surplus to animal feed preferred over sending to anaerobic digestion?

Quantifying food surplus and waste sent to different destinations does not pre-judge what the best solution is for an individual business. However, including a common set of destinations within the scope of an inventory does help businesses make better informed decisions about how to optimise performance against financial and sustainability targets.

- Why is "ploughing in" surplus considered waste? It adds nutrients back to the soil and can reduce the need for purchasing chemical-based nutrients.

While we use the term 'waste,' it is not intended to point blame at or judge growers as being the cause of the waste. The main point of tracking the amount of material (and specifically to different destinations) is to understand how much of what is grown is not able to get to people, whatever the reason. Considering this, it is also very useful where possible to collect information about the reasons for why crops and their parts did not make it into the market channels. Guidance on doing so can be found in the FLWS, Chapter 11.

Definitions (what should I be measuring?)

Crops unsuitable for harvest

- For crops not suitable for harvest due to crop failures caused by things like weather, pest or disease, does this count in the overall waste figures?

If the crop is not ready for harvest (i.e. has not yet met maturity stage parameters or specifications) but is damaged due to weather, pest or disease then this should not be measured as food waste.

Unharvested material (i.e., ready for harvest but parts or the crop left in the field or ploughed-in)

- In our field grown crops, we don't harvest 100% of the total plants (e.g. Celery where outer petioles are left in the field), where does this fall into the categories in the FLWS?
- How should the outer leaves of lettuce be treated? (left in the field / trimmed after harvesting)

If these are ready to harvest (i.e. at a stage where they would normally be harvested) then this material would be defined as food waste and should ideally be included in your overall waste figures

(where relevant). These may be considered 'inedible parts' – i.e. not intended for human consumption in your supply chain. **See note 1 above**

See also **appendix B** table for examples of 'inedible parts'

Unharvested whole crop (i.e., ready for harvest but left in the field or ploughed-in)

- Sometimes crop has matured earlier or later than expected due to severe weather, but at the point of maturity is in customer specification, but cannot be sold due to it now being surplus to sales or market requirements?
- What about crop left on the vine, plant, or bush at source (e.g. berries, grapes)
- What about crop that is not harvested due to not meeting required specifications – e.g. small potatoes?

If crops are ready for harvest (i.e. at a stage where they would normally be harvested) but for whatever reason are not harvested, then this material would be defined as food waste and should ideally be included in your overall waste figures (where relevant).

This would also apply to any crop (e.g. potatoes) that are not picked up by the harvester. If it represents a small amount of the crop and is very difficult to measure then its ok to exclude material left behind during harvest but this should be noted in the scope of what you do report.

Ideally you would track and report separately the amount that is "not harvested" (defined in the FLWS as material left in the field or ploughed-in). The reason for this may vary but tracking it enables you to understand what is being left in the field. If including an estimate of unharvested crop is not yet possible for your operations, this should be made clear as an exclusion in the scope of what you do report.

Other scenarios

- How does product that is rejected either within the supplier operations or at point of delivery to customer, fall into the waste categories?

If the product is food (or drink) and because of rejection or grading ends up going to one or more of the eight destinations that are included in the definition of food waste (see Figure 1) then such product should be included in the estimate of your operations' food waste.

If product is rejected or graded out by the original customer and subsequently re-sold to another customer then it is not food waste and should not be measured. If the product is redistributed to people (either by supplier or customer), sent to animal feed production, or used in bio-material processing then this should not be included in your estimates of food waste, but ideally (optionally) be reported separately.

- What about where product is mixed with mud and stones – e.g. potatoes?

In this case the potatoes (food) would be measured as food waste but the mud and stones are not part of the product and therefore should be excluded. It is recognised that these may be mixed together. As such, the FLWS allows for this to be an estimate if that is more practical but the calculations used should be included in the inventory report.

- What about moisture loss – e.g. when produce is stored?

Water lost through evaporation does not need to be included in any estimates of food waste, just the weight of any food that ends up as waste (including intrinsic water / liquid that is contained within that food at the time that it is sent to one of the eight destinations that are included in the definition of food waste – see Figure 1).

- Should we include quality control (QC) and other samples taken, e.g. for shelf-life studies / destructive tests etc.? (done in response to retail and other customer requirements)

If food samples are sent to one of the eight destinations that are included in the definition of food waste following any testing, then they should be included in your estimates of food waste.

- Some unharvested vegetables are left in the field and animals can graze and eat the crop – should this be classified as animal feed?

The proportion of the unharvested crop that has been eaten by animals through grazing should be classified as animal feed (and would therefore be excluded from the definition of food waste shown in Figure 1). If a significant amount of vegetables remains in the field, then this should be classified as 'not harvested,' which would be reported as food waste (in line with Figure 1). Recording the amount of the crop that is eaten by animals in the field (if significant) is valuable to get a full picture and help businesses make better informed decisions about how to optimise performance against financial and sustainability targets.

- Some unharvested vegetables are left in the field and gleaning is employed (e.g. volunteers and charities come onto farm and pick the crop) – should this be classified as redistribution of surplus food?

The proportion of the unharvested crop that has been gleaned should be classified as redistribution for human consumption (and would therefore be excluded from the definition of food waste shown in Figure 1) and reported separately. If a significant amount of vegetables remains in the field, then this should be classified as 'not harvested,' which would be reported as food waste (in line with Figure 1). Recording the amount of the crop that is gleaned (if significant) is valuable to get a full picture and help businesses make better informed decisions about how to optimise performance against financial and sustainability targets. More information on gleaning available here.

- Regrowth is harvested on some crops (e.g. rocket, mushrooms) and the number of re-cuts can vary, sometimes waste can increase if you persist with an 'old' crop or in some cases could be higher if you re-crop – how would the standard account for this?

Where this is common practice both scenarios would be in scope. The guidelines are to start measuring when a crop is deemed as 'ready for harvest' which could vary in this situation, or be repeated in the case of a crop that is harvested multiple times due to re-growth.

Understanding why waste occurs is also important but not required by the FLWS. The causes and drivers may be useful to track to support decision making.

Methodology (how I should be measuring?)

- For waste in field that isn't harvested is an estimate a good (enough) measure?

Yes. It is important though to understand and share the degree of uncertainty inherent in your food waste inventory results because this will affect both the interpretation of the results and the conclusions that can be drawn from them. The FLWS requirement is to "provide a qualitative description and/or quantitative assessment of the uncertainty around FLW inventory results." (See Chapter 9 of the FLWS for more guidance here*). Businesses should strive to improve the reliability of their estimates over time.*

Appendix A – Definitions (1)

Food: 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. “Food” does not include crops grown with the intention of becoming animal feed, biofuels, or other non-food uses.

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.

(1). The definitions of food and inedible parts are taken from the **UK Guidance**

Appendix B - table shows some of the most common examples of crop types and their inedible parts

Some of the parts listed in this table as “inedible” may be sold as “food,” that is for humans to consume; however, the following is based on our understanding of common practice in the U.K. For example, while the stems of squash plants can be eaten this part of the crop is not typically harvested by growers. The use of these parts is based on a grower’s decisions as well as customer, market, or regulatory demands.

Inedible parts separated/removed from product (Left in the Field at Harvest)		
Crop type	**Inedible Parts**	**Supporting comments about common practice in the U.K.**
Whole head lettuce	**Outer leaves and or base and stem**	**Left in the field at harvest**
Tomatoes (off the vine)	**Vines**	**Left in the field when crop is picked**
Celery	**Outer petioles**	**Left in the field at harvest**
Cauliflower / cabbage (in field)	**Outer leaves and base**	**Left in the field at harvest**
Leeks and spring onion	**Flag trimming in field**	**Left in the field at harvest**
Inedible parts separated/removed from the product (Post- Harvest)		
Crop type	**Inedible Parts**	**Supporting comments about common practice in the U.K.**
Carrots/parsnips	**Carrot/parsnip tops**	
Beetroot	**Stem and leaves**	
Cauliflower/ cabbage in cold store (trimmed after storage prior to bagging)	**Outer leaves**	
Whole head lettuce	**Outer leaves and or base and stem**	
Celery	**Outer petioles**	
Leeks and spring onion	**Flag trimming**	**These parts can be**

Tomatoes (off the vine)	**Vines**	**separated/removed at different stages post- harvest depending on the operation e.g. grading, packing, processing, preparing (cut produce).** **They may also be removed as part of the Quality Control testing process**
Bell and Chilli Peppers	**Stalk and seeds**	
Vegetables - Carrots/Parsnips/Potatoes/Swede/Onions	**Outer layer or skin removed**	
Fruit – Melons/Mangos/Pineapple	**Outer layer or skin removed**	
Apples & Pears	**Stalk, core and pips**	
Pomegranate	**Peel and pith**	
Pineapple	**Core, crown, peel**	
Banana	**Skin/ Peel**	
Citrus (Soft/ Hard)	**Peel, pips**	
Grapes	**Vines**	
Mangoes & Avocadoes	**Stones and skin**	
Strawberries	**Green calyx**	
Coconuts	**Outer shell and husk**	
Chestnuts	**Outer shell**	
Melons	**Peel and seed cavity**	

Acknowledgements:

We would like to thank the following organisations who have been involved in developing these guidelines: WRAP, World Resources Institute (WRI), G's Fresh, dps Ltd, ProduceWorld, Puffin Produce, IPL, Bakkavor