How much food do we waste in Ireland?

Prepared March 2021 and updated in April 2022; this document is intended to provide a snapshot on the nature and extent of food waste in Ireland based on currently available information and may subsequently be amended as new information comes available.

Summary

- Globally, more than one quarter of food produced is wasted. When food is wasted, all the resources used in bringing food to our tables are wasted too.

- From a climate perspective, food loss & waste is a major issue, contributing 8-10% of global anthropogenic GHG emissions.

- In line with the food waste hierarchy, food waste prevention should be prioritised and any unavoidable food waste that arises should be treated in the most resource efficient way possible. Diverting food waste from landfill has environmental and financial benefits, but the benefits of food waste prevention are even greater.

- Using current best estimates, Ireland generates in the order of 1.2 million tonnes of food waste per year however there is considerable uncertainty over this figure.

- Current household food waste is estimated to be 255,000 tonnes per annum. The average Irish household throws out 150 kg of food waste each year; at a cost of approximately 700 euro.

- Current food waste in the commercial sector is estimated to be 348,000 tonnes per annum (111,000 tonnes from retail and distribution and 236,000 tonnes from restaurants and food service).

- There is considerable uncertainty over food waste amounts in the processing and manufacturing sector, which could be as high as 500,000 tonnes, but likely to be an overestimate due to non-food waste being included in the some waste categories.

- An EPA funded project, The Efficient Food Project, has for the first time estimated the amount of food waste and loss in primary production in Ireland. The research project was led by IT Tralee in collaboration with UCD. The researchers estimated approximately 70,415 tonnes per annum of food waste is generated by primary production.

- There is a significant amount of food waste not being segregated for separate collection, with over 200,000 tonnes of food waste in residual and recycling bins. Food waste management has improved with an increase in segregated waste collections; but from a low base.

- Under recent changes to EU waste laws, Member States will have to report on amounts of food waste generated at the different stages of the food supply chain. This paper presents a first statement on Ireland's best estimates of food waste based on these reporting obligations.

- There are intrinsic challenges in quantifying food waste, and current estimates are based on best available data. These estimates are mainly derived from structures in place for national waste statistics reporting, with varying levels of confidence attached to data quality, which are discussed below.

- In particular there is large degree of uncertainty in relation to data from processing and manufacturing. The EPA is undertaking additional studies and working with sectors along the supply chain to improve data and further refine these estimates over time.

Background

Food waste is a global problem that has environmental, social and economic consequences. More than one quarter of food produced is wasted globally. Food is lost or wasted throughout the supply chain, from initial agricultural production down to final consumers. Growing, processing, transporting food all use significant amounts of resources and when food is wasted, these resources are wasted too. A significant amount of this food waste is generated at the consumer stage, and is often discarded even though still suitable for human consumption. This creates not only ethical and economic issues, but it also depletes the environment of limited natural resources. Food waste is also a significant contributor to climate change; it is estimated that food waste generates about 8-10% of global Greenhouse Gas Emissions[1].

The urgency and challenge of addressing food waste is highlighted at international level and EU level through the UN Sustainable Development Goals and the Circular Economy Package. The EU aims to reduce food waste by 50% by 2030[2].

Food waste is a priority stream within the reframed National Waste Prevention Programme (NWPP). The EPA's Strategic Action Plan 2016-2020 identified the reduction of food waste as a priority action.

The Government's Climate Action Plan and Waste Action Plan for a Circular Economy also include food waste as a priority waste stream and articulate a 50% reduction.

NATIONAL WASTE PREVENTION PROGRAMME
Preventing Waste Driving the Circular Economy

epa
Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Rialtas na hÉireann
Government of Ireland

Current Situation

Under the revised Waste Framework Directive, food waste reporting will become a mandatory part of Ireland's National Waste Statistics obligations, with first reporting due in June 2022 for reference year 2020. Member States are to measure and report on annual estimates of the amount of food waste generated at the different stages of the food supply chain. The main objective of the new reporting requirements is to provide policy makers the means for monitoring food waste sources and to support food waste prevention, in particular, edible food waste prevention.

Using current best estimates, which includes a degree of uncertainty in relation to data from processing and manufacturing, Ireland generates in the order of 1.2 million tonnes of food waste per year. Due to the high level of embedded resources and diverse collection mechanisms, post-consumer (household and commercial) food waste is of particular concern. This section provides an overview of food waste amounts and discusses data quality for each sector.

Summary of Food Waste in Ireland 2019

Sector	Tonnes of food waste	Reporting Status
Primary Production	70,415	🟡
Process and Manufacturing	497,448	🟠
Retail and Distribution	111,297	🟡
Restaurants and Food Service	236,530	🟡
Households	254,745	🟢

Primary Production

Initial estimates of food waste in the primary production in the table above are based on the outcomes of an EPA funded research project. The Efficient Food Project was led by IT Tralee in collaboration with UCD and created a first of its kind database of food loss and waste in primary production in Ireland. The research involved contacting experts for each food sector, determining the current level of national knowledge for that sector and collecting data and compiling it into a database. This comprehensive database not only includes quantities of food losses and waste, but also the reasons behind each loss. Data gaps were identified, solutions to fill the gaps were recommended therefore obtaining a clear picture of the food waste situation for primary production in Ireland for the first time.

Processing and Manufacturing

Current estimate of food waste in the processing and manufacturing sector is around 500,000 tonnes. (This figure is based on 2018 Waste Statistics reporting data). The figure above is a subset of 2018 waste statistics reporting, using list of waste codes identified to typically contain food. However, some of these codes are likely to be a mix of food waste (as defined under the decision) and other wastes. This is currently the best source of data, but the figure needs to be refined to only include material that meets criteria for both "food" and "waste", aligning it with the legislative definition of food waste. A proper classification may need to be done at the sectoral level, or even at specific manufacturing plants. A methodology to improve the quality of the data at this stage of the supply chain is currently in development by the EPA.

Retail and Distribution/Restaurants and Food Service

Current estimation of food waste in the retail and distribution sector is 111,000 tonnes, and 236,500 tonnes in the restaurants and food service sector. In general around 60% of food waste in the food services sector is classed as avoidable.

This figure was generated using 2019 waste collected data applied to 2018 waste characterisation and results from an EPA-funded study on commercial food waste[4].

There is currently no formal food waste-specific reporting system for the commercial sector in Ireland. In order to estimate the total food waste generated by this sector, results from waste characterisation studies are scaled-up using estimates of sectoral size according to Nomenclature of Economic Activities (NACE) code. As part of ongoing work on improving data quality, the EPA is planning further work to improve sectoral profiling, in particular around assigning food waste collected to the correct sector.

Households

Current household food waste is estimated to be 255,000 tonnes. This figure is based on waste characterisation results applied to 2019 Household waste collected at kerbside. This is an established waste methodology that relies on having up to date waste characterisation. The next surveys will be completed by 2022. This figure is an underestimate of total household food waste as it does not include food waste disposed to drain via the sink or composted at home. The EPA will seek to address these data gaps in future waste studies.

Using the same data sources, we can estimate food waste data per household at approximately 150 kg per annum or 52 kg of food waste per person. This food waste is estimated to cost each household around 700 euro per annum.

The EU average is estimated at 83-101 kg per person[5]. The FUSIONS study acknowledged that the data produced has a relatively high uncertainty and while useful to have as benchmark, is not fully comparable to Irish data.

Food Waste Management

In 2018 the EPA undertook a national waste characterisation study that quantified food waste in both the commercial and household kerbside municipal waste streams. Combining this information with waste collection data paints a picture of waste generation and waste management by both householders and businesses. Approximately 55% of the municipal organic waste accepted for composting/anaerobic digestion in 2019 was composted with the remainder going to anaerobic digestion.There has been a marked increase in the quantity of waste treated by anaerobic digestion in recent years. From 120,000 tonnes in 2017 to nearly 240,000 tonnes in 2019. Products of composting and anaerobic digestion are used in horticulture, landscaping and agricultural land treatment.

Households

Food waste collections are a key part of Ireland's environmental targets. Brown bin use by householders has significantly increased over the last decade from 19,000 tonnes in 2008 to nearly 160,000 tonnes in 2019. This has resulted in a decrease of food waste in the household residual waste bin; but in 2019 there was still approximately 176,000 tonnes of food waste in the residual waste bin that should that should be diverted to the brown bin or to home composting. Currently 48% of Irish households have a brown bin but separate collection of biowaste will be mandatory by end-2023, under the revised Waste Framework Directive, and the new Waste Action Plan makes the provision of an organic waste bin mandatory as part of waste collection service for all households.

Contamination of the mixed dry recycling by food waste is also an issue with household bins. In 2019 almost 11% of the recycling bin was food waste (approximately 26,200 tonnes).

Commercial

Waste management practices have improved in the commercial sector since the last characterisation study in 2008. Food donation, separate collection of food waste and organic waste have all increased substantially, albeit from a low base. Despite these positive changes there are still significant issues that need to be addressed to drive correct waste management behaviours in line with the food waste hierarchy.

There is still a significant amount of food waste not being segregated for separate collection. In a 2019 survey on commercial brown bin use[6] it was found that over 30% of businesses did not use a food waste bin despite a decade of legislation requiring same. Over 35% of the commercial residual waste bin is food waste; in 2019 there was approximately 202,000 tonnes of food waste in kerbside black bins, and 11% of the commercial recycling bin was food waste (approximately 21,500 tonnes). Contamination of mixed dry recycling with food waste has a significant adverse effect on the value of that material.

While there may always be some low levels of food waste in the residual bins, many of the poor practices identified during the recent study on commercial food waste[4] were attributed to ad hoc waste management training, particularly in businesses with a high staff turnover. Ongoing training, working with waste collectors, combined with better signage, could drive significant improvements.

Future Reporting

From 2022 Ireland will be required to report on food waste using a common methodology and minimum quality requirements agreed under the EU Circular Economy Package. This revised reporting structure recognises that each stage of the food supply chain has significantly different food waste characteristics, sources and drivers; the methodology proposed requires us to examine food waste at each stage in the chain.

Summary table for future food waste reporting:

Data on food waste amounts (in metric tonnes of fresh mass)			
	Food waste referred to in Article 1 of Delegated Decision (EU) 2019/1597		
Stage of the food supply chain	Total food waste	Fraction of total food waste, composed of parts of food intended to be ingested by humans (referred to in Article 3(a) of Delegated Decision (EU) 2019/1597)	Food waste drained as or with wastewaters (referred to in Article 3(b) of Delegated Decision (EU) 2019/1597)
Primary production			
Processing & manufacturing			
Retail and other distribution of food			
Restaurants & food services			
Households			
Sum			

White boxes: provision of data is mandatory; Shaded boxes: provision of data is voluntary.

The first report will be due mid-2022 and will be based on food waste generated in 2020.

This method of reporting will be significantly different to previous estimates and requires a review of current data sources to map correctly to the prescribed sectors, which is currently underway, in addition generating new data to address identified gaps.

Much of the reporting will be based on similar data to that described in the current situation section above.

In addition, the new reporting requirements specify that reporting 'shall not cover food waste residues within packaging waste'. These are included in the current national methodology as an element of contamination, given they are a significant component of both household and commercial food waste in residual and mixed dry recycling bins. In order to improve the quality and granularity of the data in relation to food waste placed in these waste streams, specific waste characterisation work needs to be undertaken to improve differentiation between edible and inedible food waste, liquids, fines, cross-contamination and residual contamination.

Action on Food Waste Prevention

Food waste is generated all along the supply chain and at consumer level. The causes are varied at different points in the food value chain. For example, at the early stages of agricultural production, crops may be grown which are never harvested, or harvested but wasted due to damage or fluctuations in demand. Retailers may throw away out of date or imperfect stock, and restaurants may prepare too much food and throw away food left on plates by their customers. Householders can throw away food because they buy too much or don't use it on time. Businesses and householders may not be aware of the amount of the food waste they produce and may not see that there is a problem that needs to be dealt with.

Food waste is an issue because the high level of embedded resources such as land, water, fertilizers, fuels used in growing, harvesting, processing, packaging, transporting and storing food that is then wasted. In addition, wasted food and its packaging require appropriate segregation, collection and processing which all consume resources. Disposal at landfill releases methane, a GHG many times more potent than carbon, into the atmosphere.

Over the last decade Ireland has significantly reduced the quantity of biowaste being sent to landfill. The reduction reflects a combination of factors - the falling quantities of municipal waste sent for landfill in Ireland; the increased separate collection of biowaste with the roll-out of brown bins; and the fact that most residual waste in Ireland is now pre-treated mechanically and/or bio-stabilised at waste facilities before it is sent to landfill. Even if avoidable food waste was eliminated entirely, there will still be a need for food waste collections to manage unavoidable food waste such as peel, skins, bones, etc. However the benefits of food waste prevention are even greater, given a significant portion of food being wasted is avoidable.
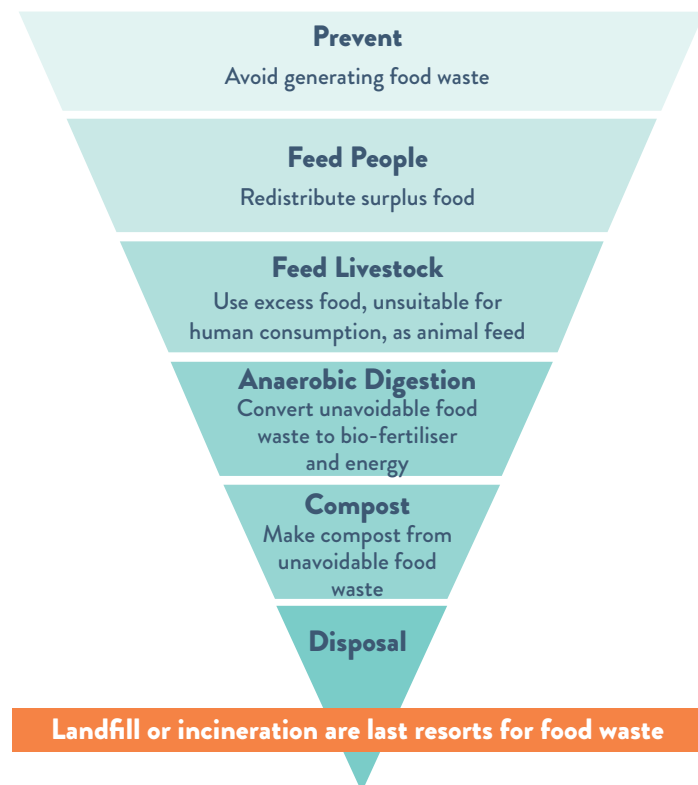
In line with the food waste hierarchy, activities need to prevent food waste first; and ensure any food waste that arises is treated in the most resource efficient way possible. Food loss and waste reduction should be integrated as part of circular economy, food and climate action policy strategies and programmes, which are sector and target-focused to prevent food waste across the supply chain and at consumer level.

The EPA's food waste prevention programme is implemented through the EPA's Circular Economy Programme. The programme delivers campaigns and supports targeting food waste in households, across the supply chain and in the hospitality sector, with a view to achieving the national target for a 50% reduction in food waste by 2030:

Household food waste: awareness raising activities and application of behavioural insights to achieve widespread public awareness of environmental and social issues around wasted food; leading to a significant increase in the number of people taking action on the issue.

Supply chain and Hospitality: activities to drive change across the retail, distribution, processing and manufacturing sub-sectors, and reducing food waste in the Hospitality and Food Service sectors. Initial actions are focused on roll-out of a standardised measurement methodology, and developing tools and resources for upskilling for action on food waste prevention.

Behavioural insight is a foundation of the programme, providing evidence and data to inform policy, behavioural change interventions and awareness campaigns, establish sectoral benchmarks and indicators, and to monitor progress.

Data and evidence: Robust and meaningful data on food waste is central to building a compelling narrative as to the benefits of preventing food waste; and for complying with national legislative reporting requirements. The EPA produces national waste statistics and therefore has responsibility for producing the relevant statistics under the Waste Framework Directive. EPA also funds research & studies to address data gaps in this area.

Forum on Food Waste: The EPA hosts the National forum on food waste bringing together business and policy leaders from across the food supply chain.

Prevent
Avoid generating food waste

Feed People
Redistribute surplus food

Feed Livestock
Use excess food, unsuitable for human consumption, as animal feed

Anaerobic Digestion
Convert unavoidable food waste to bio-fertiliser and energy

Compost
Make compost from unavoidable food waste

Disposal

Landfill or incineration are last resorts for food waste

[1] During 2010-2016, global food loss and waste contributed 8-10% of total anthropogenic GHG emissions (medium confidence)." Source: IPCC (August, 2019)

[2] Waste Framework Directive 2018 [Article 9] (Prevention measures shall) . . ."reduce the generation of food waste in primary production, in processing and manufacturing, in retail and other distribution of food, in restaurants and food services as well as in households as a contribution to the United Nations Sustainable Development Goal to reduce by 50 % the per capita global food waste at the retail and consumer levels and to reduce food losses along production and supply chains by 2030."

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D1597&from=EN

[4] https://foodwastecharter.ie/wp-content/uploads/2019/07/CTC-Research-Report-EPA-282.pdf

[5] http://eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf

[6] http://www.cre.ie/web/wp-content/uploads/2019/10/RED-C-Commercial-Food-Waste-Survey-Sept-2019.pdf

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