Greencore Group

UK

Food waste inventory – Financial Year 2017

(October 2016 – September 2017)

Company background

Greencore is a fast growing, international convenience food manufacturer.

In the UK, Greencore is a supplier of own-label convenience food products to all of the major UK supermarkets, and has world-class manufacturing sites with industry-leading technology and supply chain capabilities.

Greencore has strong market positions across sandwiches and other food to go products as well as complementary positions in other convenience food categories, including chilled prepared meals, chilled soups and sauces, ambient sauces, pickles and Yorkshire Puddings.

Greencore is committed to conducting its business activities in an environmentally responsible and sustainable manner.

As part of that policy, **in 2017 we made a commitment to reduce food waste in our own operations by 50% by 2030,** using FY17 as a baseline.

FRIENDS OF CHAMPIONS 12.3

What we are doing to tackle food waste

At Greencore, we want to actively manage our impact on the environment, including efficiently using and respecting all resources. We're focusing on a number of areas, including reducing food waste produced through the manufacture of our different products, redistributing surplus food, and exploring new ways to put inedible food to good use.

Tackling food waste within our operations

Greencore is investing heavily in our Greencore Manufacturing Excellence (GME) programme, which aims to significantly reduce the amount of waste food created during our operations. We launched Greencore Manufacturing Excellence in summer 2017 across all 15 of our UK sites and have since seen Standard Operational metrics improving across the UK towards reducing food waste.

We now have an improvement team in place across the UK to deliver specific tools for our sites to reduce food waste, including regular reporting and collaborative sessions and new techniques to drive waste reduction and yield improvement. Some early success stories in 2018 include:

1. A new diagnostic tool that delivers reductions in food waste in many of our processes
2. Improvements to prawn preparation processes in sandwich production to reduce food waste
3. In-house modifications to sandwich cutter aligners reduced cutter waste by 50%. A bespoke hygienic version has been manufactured for roll out to all sandwich sites

Our other initiatives to reduce food waste

Redistributing surplus food

Greencore works with a number of organisations to redistribute as much of its surplus product as possible. These include Fareshare, The Company Shop, and its charity, The Community Shop which provides support services to vulnerable and disadvantaged people.

In our 2017 financial year, we avoided 746 tonnes of waste by redistributing food for human consumption through Fareshare and The Company Shop/Community Shop, equivalent to around 1.8 million meals. We have recently also started to work with the Felix Project in West London who collect surplus food for charities so they can provide healthy meals and help the most vulnerable in our society.

Sending food for use as animal feed

Where we can segregate our food waste, we collect suitable food and ingredients for use as animal feed. This activity is limited predominately to waste bread crusts from sandwich manufacturing operations as we need to take care to avoid cross contamination. In our financial year in 2017, we sent 7,285 tonnes of food waste to animal feed.

Exploring new ways to generate biorenewables

Unfortunately, waste from certain ingredients used in the manufacturing of our products is currently unavoidable (for example bread crusts form the end of loaves for sandwiches, avocado peel and stones, beetroot peelings). We are exploring several projects with third parties and universities to try to maximise value from these waste streams through direct extraction ingredients still of use, and the use of food wastes as components for other products like food dyes. This year, we linked up with Toast Ale to regularly provide waste bread from sandwich production into Adnams brewery for use as an ingredient in beer.

Total food produced

392,654

tonnes

Waste as a % of production

10.7%

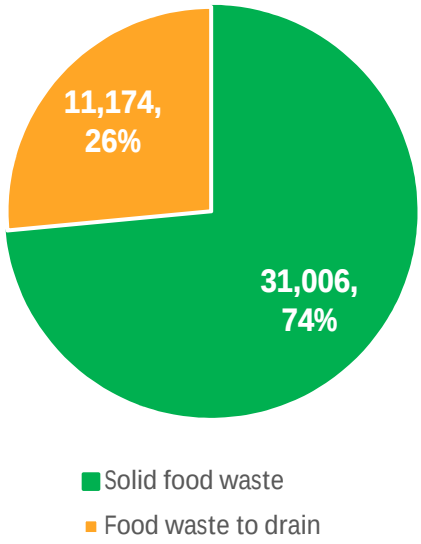
Includes losses to drain of 2.8%

Overall food waste

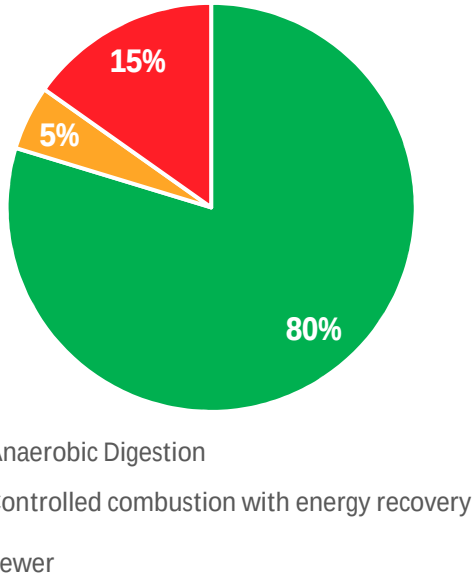
42,180 tonnes

Includes losses to drain of 11,174 tonnes

Waste by category



Waste by destination



Food waste data commentary

- This waste data is based on all of the waste streams (including losses to sewer) from all of Greencore's UK Operations (manufacturing and distribution), for our 2017 financial year (1 October 2016 to 29 September 2017).
- Our total food production (UK) for this period was 392,654 tonnes. Our food waste was 42,180 tonnes, which equates to 10.7% of food produced. Our total food waste excluding losses to drain was 31,006 tonnes, which equates to 7.9% of food produced.
- Greencore has a diverse and extensive product range that we provide to large customer base. Many of our products have short shelf life. These factors result in shorter production runs and more frequent changeovers which leads to a higher risk of wastages.
- Very short shelf life products have also made food redistribution more challenging but we continue to work with our food redistribution partners to find solutions to this.
- Given the diverse nature of our manufacturing operations, our food waste is in many different formats, and from different sources; comprising various ingredients, part processed or finished products, ingredients residues on primary packaging, waste associated with washing down processing equipment, out of specification ingredients and inedible parts (e.g. beetroot peelings, avocado stones etc).
- The majority (80%) of our food waste goes to anaerobic digestion, either directly on or off site, or indirectly after being removed in our effluent treatment plants. Our AD plant processing liquid food waste at Selby produced just under 1MWh of electricity, approximately 10% of the sites electricity demand. 15% of our food waste is lost directly to sewer, whilst the remaining 5% ends up in our general waste streams that are sent to controlled combustion with energy recovery.

Food Waste Inventory – Appendix 1: Q&A on food waste

Why has Greencore reported its food waste figures?

Greencore has committed to support the Champions 12.3 initiative which aims to reduce food waste globally. This is an activity under the Sustainable Development Goals (SDGs), specifically SDG 12 on Sustainable Production and Consumption. As part of the commitment, Greencore will measure and publish its foodwaste data annually, and work towards reducing waste in our own operations by 50% by 2030.

Why does Greencore produce food waste?

Greencore has 15 UK manufacturing sites producing food for multiple retailer customers. The majority of its production is fresh, chilled food which means it has a short shelf life. Therefore, any surplus cannot be stored but must be consumed within days of production. Likewise, the raw materials used to produce our foods also tend to have short shelf lives. Events during production runs, changes in demand, trialling of new product lines etc can all lead to food waste being generated.

Some of the waste we generated is classed as inedible; this includes materials such as the skins and stones from avocados, or peelings from beetroot at our pickling plant. These generate large volumes of waste.

Why is Greencore's food waste so high (as a % of production)?

We have made every effort to ensure that we measure our food waste as carefully as possible and include all sources of waste. We have included waste food that can be mixed in with the general waste stream through contamination of materials, and also the waste that goes to drain. Depending on the factory, the food waste to drain may be treated in an effluent plant and we have included this measurement in our calculations. Our calculation includes both edible and inedible food waste. Inedible waste includes materials such as the skins, stones and peelings from fruit and vegetables.

We believe that our careful calculation of food waste combined with the type of chilled foods we produce, has resulted in this level of food waste as a percentage of our production (10%). We have already begun to take steps to reduce this figure.

Greencore has a diverse and extensive product mix across a large customer base. Many of our products have short shelf life. These factors result in shorter production runs and more frequent changeovers.

What does Greencore do with food waste?

We manage our food waste in a number of ways. Where we have surpluses, whether as a result of too much product being made, or as a result of new product trials, or surplus raw materials, we re-distribute the food. We work with organisations including The Company Shop and FareShare to ensure that this food reaches people.

A small amount of our food waste is suitable for use as animal feed and is provided to feed companies.

We work with universities and businesses to identify opportunities to recover materials of value from our food waste. For example, the beetroot peelings that are generated in our pickling plant contain valuable colourants which can be extracted for use in food or non food applications.

The majority of our food waste is sent to anaerobic digestion where it is used to generate energy in the form of biogas.

What is Greencore doing to reduce food waste?

We have teams in place in our manufacturing sites dedicated to continuous improvement of our processes. Part of their remit includes reducing all forms of waste. These teams looks at all aspects of production to understand where losses occur and how to reduce or eliminate them.

We accept that as a food manufacturer we will always generate an amount of surplus or waste, both inedible and edible. It is our goal to ensure that as long as safety and quality considerations allow, edible food is provided to people for meals and not discarded as waste.

Is Greencore part of the WRAP and IGD initiative on food waste?

Greencore is supporting the initiative by WRAP and IGD to reduce food waste which was launched on 25th September. We have already committed to measure our food waste, report it on our web site and put actions in place to reduce it by 50% by 2030.

A. TABLE TO REPORT FLW INVENTORY

FOOD WASTE INVENTORY BASED ON TESCO RECOMMENDATIONS AND *FLW STANDARD* REQUIREMENTS (see www.FLWProtocol.org for details and guidance)

SUMMARY
Company name: Greencore Group
Name of person filling out report: Group Environmental Manager
Date published: 25th September 2018

- **Overall food waste tonnage:** 42,180 tonnes
- **Food waste in tonnes as a % of food produced in tonnes:** 10.7%

OPTIONAL:

- **Quantitative breakdown of food waste tonnage by key categories (composition of food waste):** A more detailed breakdown of food waste types by location is reported internally. A simplified aggregated version is included in Figure 1 below.
- **Food waste amount by destination:** A breakdown by destination is included in Figure 2 below.
- **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:** Breakdown is published on Greencore's website and included in Figure 3 below.
  Surplus food to redistribution: 746 tonnes
  Food to animal feed: 7,285 tonnes

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

- **Relevance:** Data provides a full assessment of all food waste and surplus through all redistribution, recovery and disposal routes for all UK operations (including losses to drain/sewer), to facilitate a targeted approach to waste prevention and reduction.
- **Completeness:** All UK manufacturing and distribution operations are included, and all waste streams and destinations have been included.
- **Consistency:** A standard methodology has been established for annual reporting in a consistent manner
- **Transparency:** A summary of the methodology is included below.
- **Accuracy:** The level of accuracy varies between the different waste streams and destinations.

2. **Account for and report the physical amount of FLW expressed as weight**
Food waste is reported in tonnes, and as a percentage of total production weight.

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

- **Timeframe**: 12 months – Greencore Financial Year FY17 (1st Oct 2016 to 29th Sept 2017)
- **Material type**: Food and associated inedible parts
- **Destination**: While multiple destinations fall under the definition of "food waste", in the UK, food waste from Greencore only goes to Anaerobic digestion, to sewer, or to controlled comsbustion with energy recovery (see figure 2 below).
- **Boundary**:
  - *Food category*: All food ingredients handled and product produced and/or distributed in the UK
  - *Lifecycle stage*: Direct manufacturing and distribution operations
  - *Geography*: UK
  - *Organization*: Greencore Group
- **Related issues**: Packaging weight is excluded.

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 compostion analysis. An overview of the methodology is included below.

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)**

- Sampling techniques have been used to estimate the food waste losses to sewer/drain at all sites, and liquid waste streams that are tankered off site to go to Anaerobic digestion processes. A summary of the sampling methodologies used:
  - To sewer (various methodologies depending on the nature of the food waste in the effluent and the monitoring data available):
    - Analysis of regular composite effluent samples combined with effluent volume measurement (flow meters) to determine total effluent loading (KgCOD – Chenical Oxygen Demand) for individual sites. This is converted to a product equivalent estimate, utilising the average Kcal/100g for common products manufactured on that site, and a conversion from COD). This methdology was mainly used in our Prepared Meals division where a larger proportion of liquid products and ingredients are typically used and produced.
    - Analysis of effluent sludge removed on Disolved Air Flotation (DAF) effluent treatment plants (solids content typicallly 70% from food waste, and 30% from DAF chemicals), combined with sludge total weight from tankers passing over a weighbridge to estimate food waste in the sludge. Regular testing of pre- and post DAF effluent quality enables a good estimate of the proportion of food waste in the sludge, and the remaining food waste to sewer to be estimated. This methodology was mainly used in our Food to Go division, where a significant proportion of the food waste to drain (>80%) is recovered into the DAF sludge.
    - For some of our smaller sites where there is limited or no effluent sampling and analysis, and factor (Kg food waste per m^3 of effluent discharged) based on similar sites where there is detailed monitoring has been applied to the effluent volume to estimate total food waste to sewer. This represents a very small proportion of the total food waste loss to sewer.
  - To Anaerobic digestion – some of the food waste streams contain packaging. For each relevant waste stream, our Group waste management team worked with waste service providers to estimate the levels of packaging present through a visual and physical assessment of a number of waste loads. This was used to give an approximate % packaging content that was applied to the total tonnage for that individual waste stream (directly measured over weighbridges) to get an estimate of the total food waste.
  - To controlled combustion – some of the general waste streams contain a small proportion of food waste (e.g. residues on ingredient packaging, part processed products or where local segregation has not been totally effective). For each relevant waste stream, our Group waste management team worked with waste service providers to estimate the levels of food waste present through a visual and physical assessment of a number of waste loads. This was used to give an approximate % food waste content that was applied to the total tonnage for that individual waste stream (directly measured over weighbridges) to get an estimate of the total food waste during the year.

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

- The majoirty of the waste streams (all solid food waste and any effluent sludge or liquid food waste tankered off site) passes over a weighbridge to obtain a total weight, and will be accurate. Uncertainties over the quantification of these waste streams will come from:
  - Estimates of the level of packaging in some food waste streams as outlined in section 5 above (although the level of packaging is generally a small percentage of the total weight and not a significant factor). The assessments of packaging content have been made by our waste management team in conjunction with the waste service providers that handle the waste day to day and have a good working knowledge of its typical composition.
  - Estimates of the level of food waste in some general waste streams as outlined in section 5 above (although the level of food waste in general waste is generally a small percentage of the total weight and not a significant factor). The assessments of food waste content have been made by our waste management team in conjunction with the waste service providers that handle the waste day to day and have a good working knowledge of its typical composition.
  - Losses to sewer/drain – for sites where this is a significant factor there is typically daily analysis of composite effluent samples, and continous monitoring of effluent flow and volume. The level of uncertainty relating to food waste to sewer are much lower at the sites where effluent is a significant proportion of the food waste. For some of the smaller sites there is a greater level of uncertainty where the estimated food loss to drain is based on a smaller number of composite samples being analysed, or a loss factor generated from a similar production site.

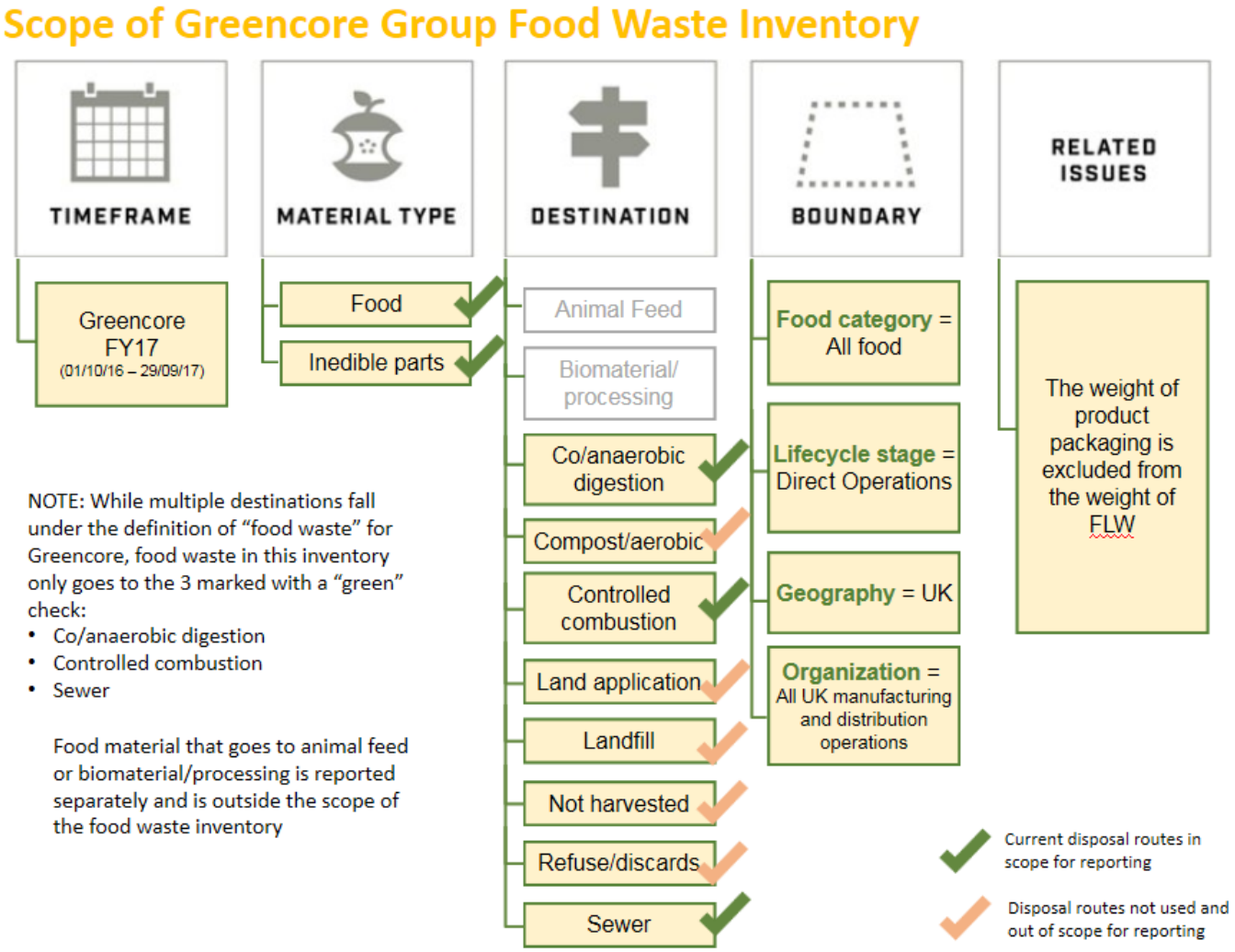
7. **If assurance of the FLW inventory is undertaken (which may include peer review, verification, validation, quality assurance, quality control, and audit), create an assurance statement**

Internal peer review undertaken within Group Sustainability team. No 3rd party assurance to date.

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 is Greencore Financial Year FY17 (1st Oct 2016 to 29th Sept 2017)
    - Food waste reduction target of 50% by 2030
        - **With a base year figure of 10.7%, this target is <5.35% food waste as a percentage of production by 2030**

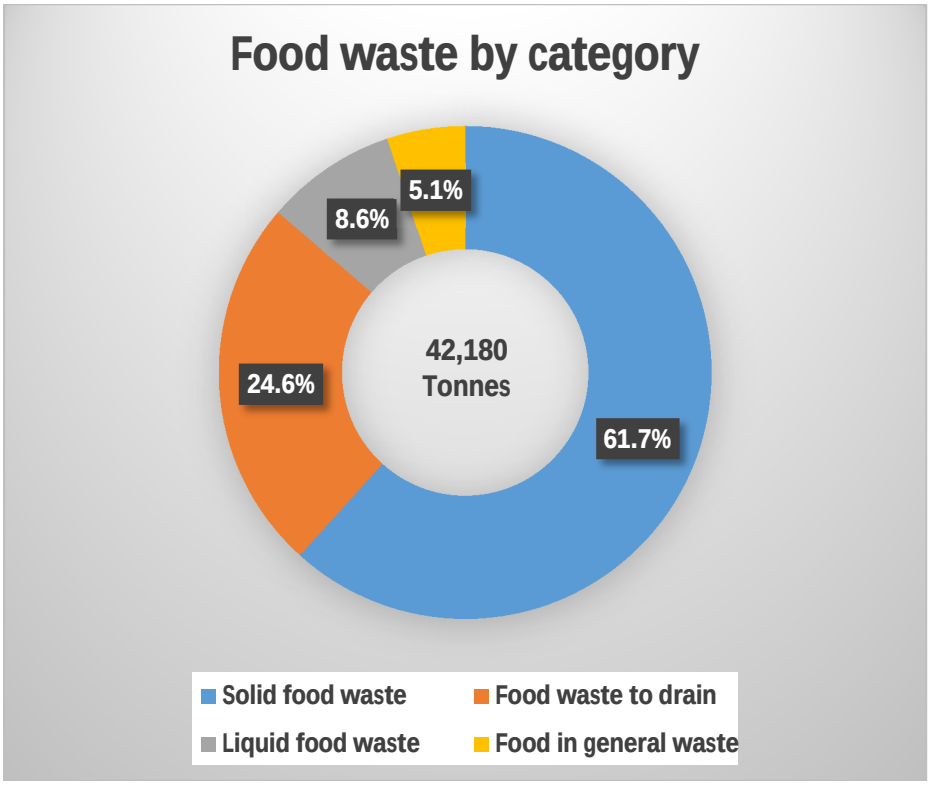
B. FIGURE TO SUMMARIZE SCOPE OF FLW INVENTORY

This figure sums up visually the scope of the food waste inventory being reported in the table.



C. OPTIONAL BEST PRACTICE INFORMATION

Figure 1. Quantitative breakdown of food waste tonnage by key categories (composition of food waste)



Categories used in this breakdown (all include edible and inedible parts):

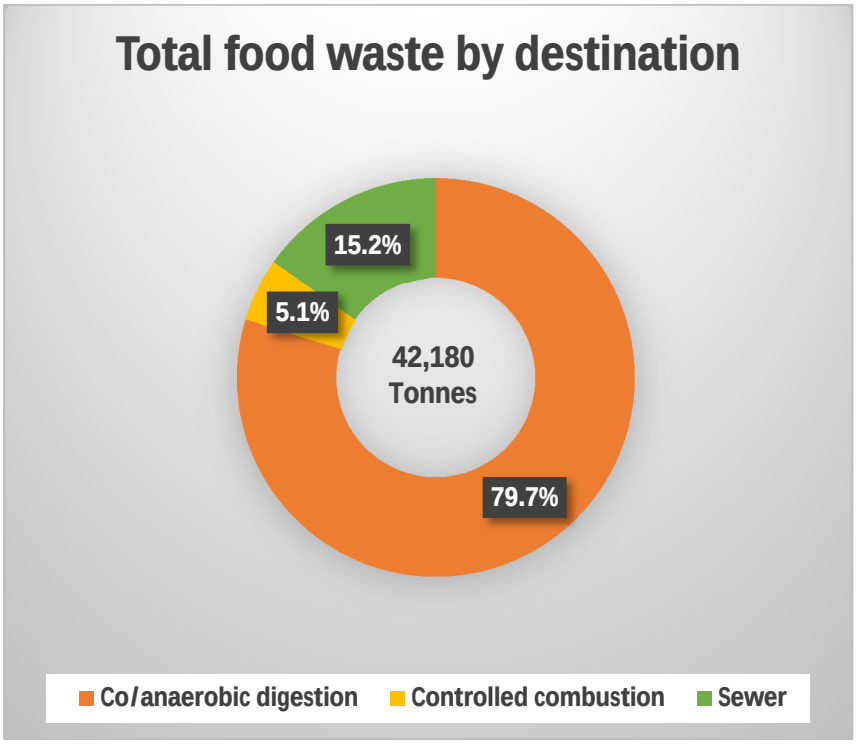
- Solid food waste:
  Solid food (ingredients and product) that leaves site in a skip/container and goes to anaerobic digestion

- Liquid food waste:
  Liquid food, ingredients or effluent sludge that leaves site in a tanker and goes to anaerobic digestion

- Food waste to drain:
  Solid or liquid food ingredients and product that has been washed to drain, generally from on-site cleaning of processing equipment

- Food in general waste:
  Solid food ingredients or product that leaves site in a general waste skip/container to go to controlled combustion with energy recovery.

Figure 2. Food waste amount by destination



Note:
Whilst the chart above shows the food waste by destination, it doesn't give the full picture of the nature of the waste when compared to other companies that haven't yet included a measurement of food waste lost to drain. The chart below provides a split of the food waste based on local destination on site to a drain or not. (Note – our Selby site produces sauces and handles large quantities of liquid ingredient and product. The waste to drain on site is significant, but is treated in our own on site Anaerobic Digestion plant (with biogas generated producing around 10% of the sites electricity). Whilst the loss is to drain, when shown by destination this waste will be classified to Anaerobic digestion. All of our effluent sludge that is generated on sites goes to anaerobic digestion, but originates from food waste lost to drain. The chart below shows the split between food waste losses to drain or not to drain.

Our total food waste excluding losses to drain is 31,006 tonnes, equivalent to 7.9% of production. Losses to drain account for 11,174 tonnes, equivalent to 2.8% of production.

Figure 3. 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 redistribution	Tonnes	As % of production
Human consumption (Company Shop, Community Shop, Fareshare)	746	0.19%
Animal Feed	7,284.7	1.86%
Total	**8,030.7**	**2.1%**

A full summary of all materials assessed is shown below:

Description of destination		Tonnes	As % of production	Total tonnes	Total as % of production
Waste avoided	Redistribution	746	0.2%	**8,031**	**2.1%**
	Animal Feed	7,285	1.9%		
Food waste	Co/Anaerobic Digestion	33,619	8.6%	**42,180**	**10.7%**
	Controlled Combustion	2,166	0.6%		
	Sewer	6,395	1.6%		

Note – total production for FY17 = 392,654 tonnes