



FOOD WASTE MAPPING GUIDE



EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

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1 INTRODUCTION

1.1 Why is food waste a problem?

Throwing food away has a financial impact that goes far beyond the commonly reported costs associated with waste collection. By reducing the amount of food that is wasted and ultimately disposed of, savings can be made through the avoided purchase of ingredients and meals, lower kitchen utility bills (i.e. gas, electricity and water consumption), more efficient use of staff time and lower waste disposal costs.

While it is not practical to reduce food waste to zero, Health Boards should focus on food waste prevention as there is a potential to generate substantial savings. For healthcare organisations, the true cost of food waste is estimated to be around £1,900 per tonne or 22p for every meal served¹. Research has estimated that the true cost of food waste to NHS Scotland is £4.2 million².

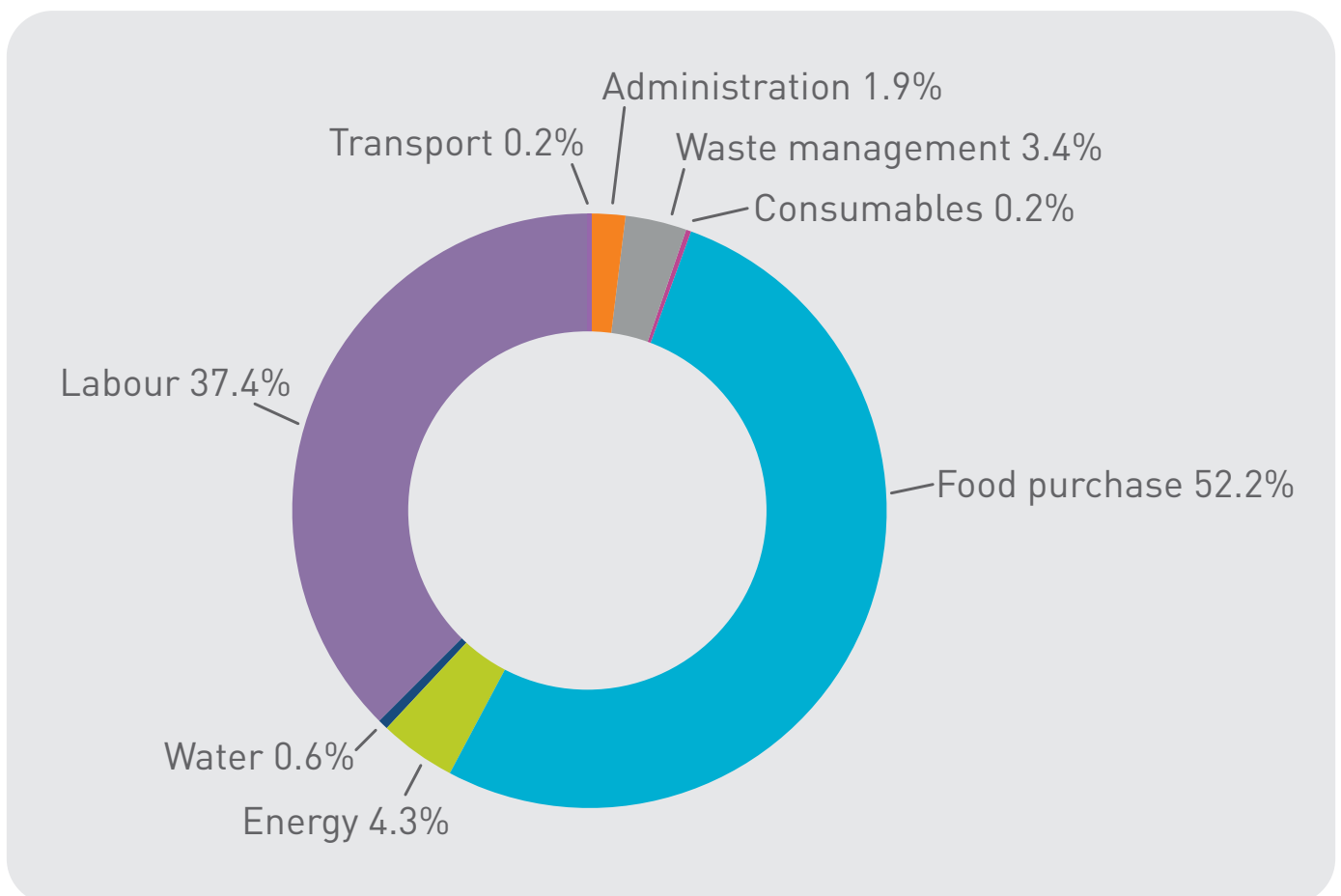


Figure 1 The true cost of food waste³

¹WRAP (2014). The true cost of food waste

²NHS Scotland produces approximately 19 million patient, visitor and staff meals every year

³WRAP (2014) The true cost of food waste

There are a number of other reasons to take action on food waste including:

- **It is a legal requirement** - Under the Waste (Scotland) Regulations 2012, all food businesses producing more than 5kg of food waste a week must segregate their food waste for collection (some rural locations are exempt). For healthcare facilities, this will include the segregation of food waste in ward kitchens and pantries, staff rooms, restaurants and retail units.
- **Help Scotland meet its ambitious food waste target** - As part the Scottish Government's Food Waste Reduction Action Plan, Scotland is committed to reducing food waste by 33% by 2025. All Health Boards can make a significant contribution to this reduction.
- **Save water, energy and carbon** - Growing, producing, transporting and cooking food uses huge amounts of water, fuel and energy.
- **Divert from landfill** - When food waste breaks down in landfill it releases methane, one of the most damaging greenhouse gases.

1.2 Why monitor your food waste?

By regularly measuring and monitoring your Health Board's food waste, you will start to identify patterns of wasteful behaviour and opportunities to reduce food waste, improve environmental performance and save money. Often catering professionals know wastage is occurring but may not have measured it or appreciate its full environmental and financial impact. Measuring waste helps to prioritise waste prevention activities, by focusing on those that have the most prevention potential, and also provides a useful baseline when monitoring the impact of any improvements.

Staff will also appreciate your efforts to reduce food waste and become more environmentally conscious. Environmental action in the workplace can lead to improved attitudes towards work and staff will feel like a valuable part of the effort as they are encouraged to contribute and participate in improved environmental behaviours.

YOU WILL START TO IDENTIFY PATTERNS OF WASTEFUL BEHAVIOUR AND OPPORTUNITIES TO REDUCE FOOD WASTE, IMPROVE ENVIRONMENTAL PERFORMANCE AND SAVE MONEY.



THE FOOD WASTE HIERARCHY

The food waste hierarchy sets out the most environmentally preferred solution for the management of food waste, as shown in Figure 2. The preferred solution is to prevent food waste from occurring in the first place. The food you do not buy and do not cook will never be wasted.

If surplus food is generated, you should first consider redistribution to people, where appropriate, or to be used as animal feed, provided this is done in compliance with the relevant legislation. Next, effective food waste treatment options should be considered, like anaerobic digestion or composting. All of these are preferable to landfilling food waste.

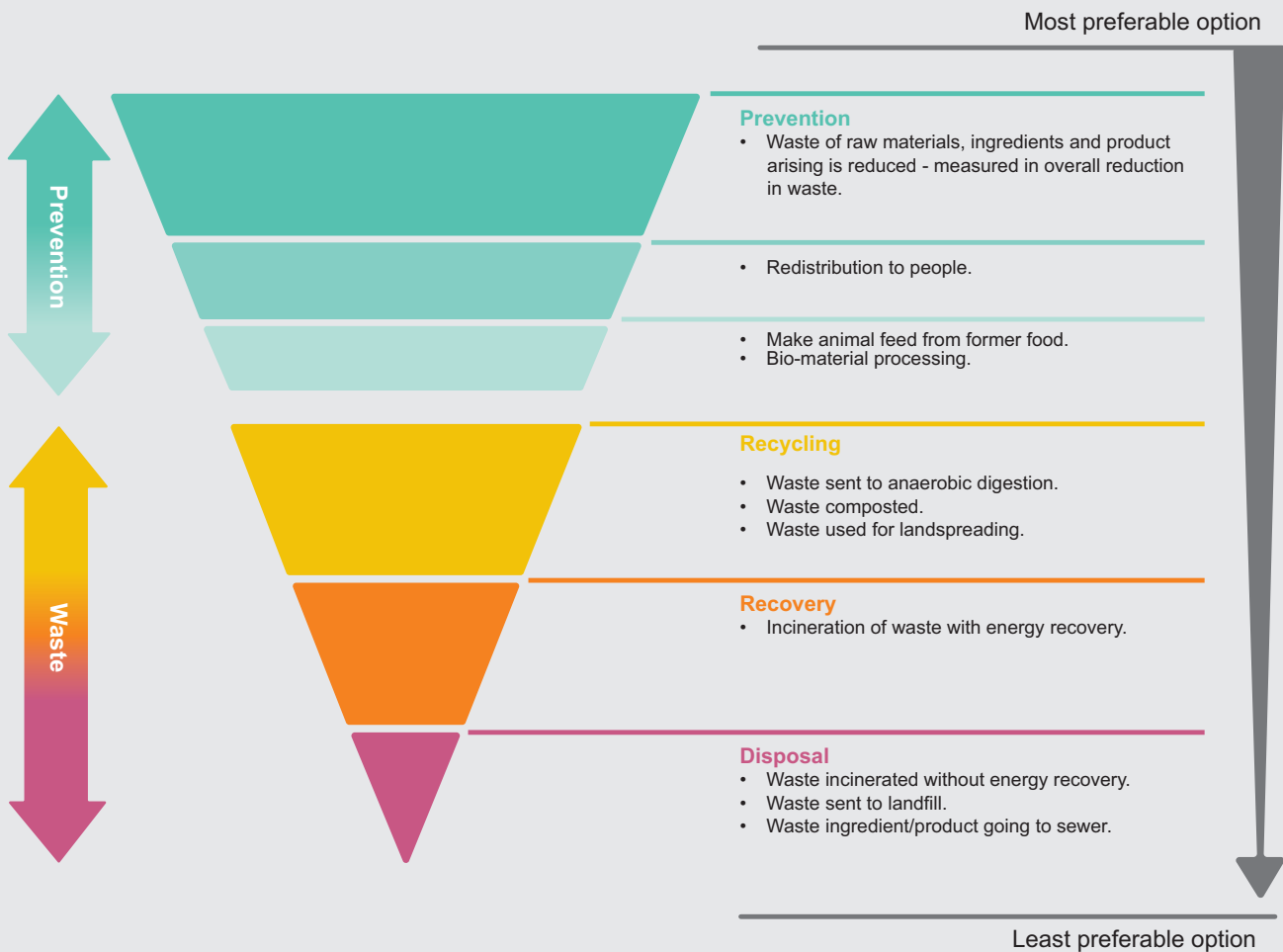


Figure 2: The food waste hierarchy

2 THE FOOD WASTE MAPPING PROCESS

While there are a number of ways to identify food waste prevention opportunities, successful food waste mapping exercises follow a four-step process outlined in **Figure 3**.

Using this process will help ensure that you identify food waste prevention opportunities. It will also help you to prioritise your opportunities, and where necessary, secure the support and funding you need to make them happen.

The process starts in **step 1** by assessing your current food waste data. Understanding where food waste is produced in your organisation will help to guide you to the areas of highest importance.

Step 2 involves carrying out an audit to develop a better picture of the food waste generated in your facilities, the quantity generated in different areas, why it is generated and how it can be reduced.

Having completed your audit, **step 3** is where you can review and prioritise all your opportunities and develop an action plan.

Finally, as it is unlikely that you will be able to do everything on your action plan without resourcing and financial support, **step 4** involves preparing a business case for your prioritised opportunities.

This guide will now take you through each of these steps. During each step, you should involve senior management, waste management officers, sustainability officers, catering staff, ward housekeepers, dietitians and nurses. Where relevant, you should also involve any facilities management companies and food and drink retail providers (e.g. Royal Voluntary Service).

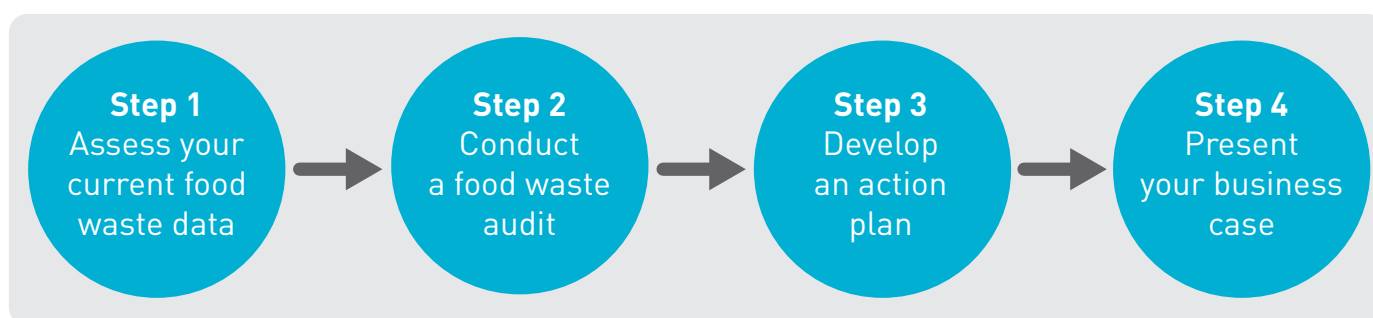


Figure 3: Food waste mapping process

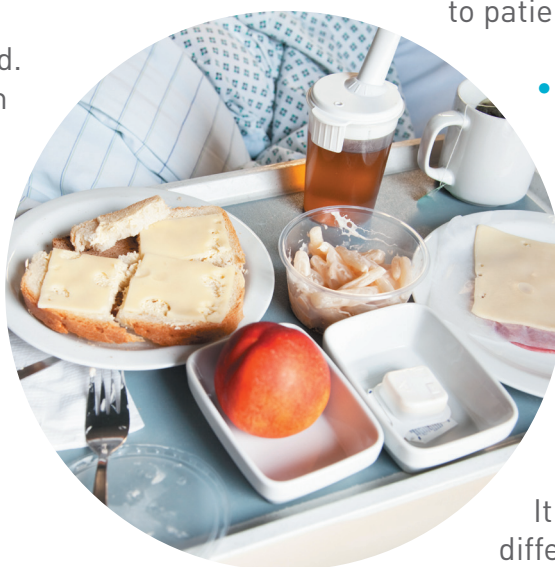
3 ASSESS YOUR CURRENT FOOD WASTE DATA

Understanding where food waste is produced in your healthcare facilities and the current sources of food waste data is an important starting point.

3.1 Where is food waste produced?

You need to think about the different sources of food waste across your Health Board. Often only unserved meals are considered but food waste occurs at all stages in the food service chain including:

- Spoiled and out of date food. This includes spoilage from the main kitchen but also spoilage from ward kitchens and any food and drink retail outlets.
- Food preparation waste. This includes any leftover food that is wasted as part of the meal preparation (e.g. eggshells, vegetables peelings, meat trimmings).
- Over preparation from the main kitchen. This is often as a result of over-ordering at ward level or because ordered meals weren't cancelled and includes any prepared food portions that cannot be re-used or frozen.
- Unserved meals from the wards and the hospital restaurant. For a bulk food supply system, this includes food not served to patients and left in containers at the end of the service. For a plated food system, this includes any unserved meals.
- Plate waste. This includes any uneaten food left on plates after a meal is finished (either from the wards, the hospital restaurant or any hospital cafés). Meals that are returned by the patients untouched also contribute to plate waste.



- Leftover snacks from patients outside of mealtimes.
- Leftover food in wards, offices or restaurants, brought in by staff, patients and visitors, or from any food and drink retail outlets.

The food delivery system used can also impact on the sources of food waste. While every hospital is different, there are two main delivery systems by which food is delivered to patients:

- Bulk food supply. This is where food is prepared in the main kitchen and sent, in bulk containers, to the wards, where it is plated. This system can be operated with or without menus.
 - Centrally plated. This is where food is prepared and plated in the main kitchen. It is then transferred to the different wards before serving.

The food provided to the wards (in bulk or plated) can be cook-serve, cook-chill or cook-freeze. Cook-chill is prepared in advance (either in a central kitchen or by an external company) and then chilled. The chilled food is then heated in special ovens or trolleys in the wards. Cook-freeze is prepared in advance (by an external company) and then frozen.

The frozen food is then regenerated in special ovens or trolleys in the wards. A cook-serve system is a 'traditional' catering operation where food is prepared and cooked on site and distributed to the wards.

In addition, the type of healthcare facility (e.g. acute facility, community hospital) will also impact on the volumes of food waste.

3.2 What data should be collected?

Once you have established where food waste is being produced, you can start thinking about the data you should be collecting. Monitoring food waste generally involves collecting and quantifying all of the related food waste data held by your Health Board. Ideally you will be able to access information going back several years as this will help you to build up a historical picture and start identifying performance issues and immediate savings opportunities. Where this is not available, you will need to collect new data.

There will already be a range of useful data on food waste and the key is to think about where it is kept, who to ask about it, what format it is in and how often it is collected or received.

Some key questions to ask yourself to help you identify your data requirements include:

- **How much detail is needed?** The level of data required depends on what the data is going to be used for. Generally speaking, detailed data helps to pinpoint problems and provide an accurate picture of what has happened. Collecting and analysing detailed data can be expensive and time consuming, so plan ahead and collect only as much as is needed.
- **When and how often are data needed?** The more frequently you can collect data the quicker you will be able to spot problems and the more accurately you will be able to pinpoint performance issues. Data can take time to collect, and sometimes you will be limited by the availability of data from your waste contractor or suppliers. You should experiment to find the balance that works for you and aim for a minimum of a monthly data collection cycle. The earlier you can start to collect data the better. Do not wait until after you have started making any improvements. Having data before and after taking action will help you make comparisons and track the progress of your projects.



- **What format is the data required in?**

Remember that data comes in different forms. Extra work may be required to reformat data that are not in an accessible format.

- **Who holds the data?** Data can come from many different sources (e.g. finance department, senior managers, estates department, catering department).
- **Is the data available, accurate and reliable?** If data is not available or is not of sufficient quality or relevance, you may need to put in processes to collect the data manually.

Table 1, on the next page, illustrates the type of information you might need and common sources of the data. The data that you choose to collect will depend on what you want to find out, the time and resources that you have available to gather the data and the possible costs of collecting it (e.g. the staff time or investment in purchasing weighing equipment).

THE KEY IS TO THINK ABOUT WHERE IT IS KEPT, WHO TO ASK ABOUT IT, WHAT FORMAT IT IS IN AND HOW OFTEN IT IS COLLECTED OR RECEIVED.

Information needed	Existing source of data	Who to ask	Considerations
Total weight of food waste by site	<ul style="list-style-type: none"> Data report from waste contractor Waste invoices Waste transfer notes 	<ul style="list-style-type: none"> Waste contractor Finance department Waste management officer 	<ul style="list-style-type: none"> Understand the source of the data (e.g. on board weighing or based on container volume) Review invoices for the last 12 to 24 months to determine the levels of waste being generated throughout the year Gives no indication of what is in the waste Changes to your waste contractor can lead to variations in the data
Total weight of food waste by department / ward	<ul style="list-style-type: none"> Food survey data 	<ul style="list-style-type: none"> Catering Manager Housekeeping Leads; Nursing Leads; Retail Leads 	<ul style="list-style-type: none"> You may need to carry out a food waste survey to collect this data (see Section 3.2)
Unserviced patient meals (by ward / department)	<ul style="list-style-type: none"> Meal ordering system report Demand forecasting data 	<ul style="list-style-type: none"> Catering Manager Ward Managers; Housekeeping Leads 	
The number of meals ordered / sold (by ward / department)	<ul style="list-style-type: none"> Meal ordering system report Demand forecasting data Restaurant till report 	<ul style="list-style-type: none"> Catering Manager Housekeeping Leads; Nursing Leads; Retail Leads 	
The percentage of food wasted per meal	<ul style="list-style-type: none"> Food survey data 	<ul style="list-style-type: none"> Catering Manager Housekeeping Leads; Nursing Leads; Retail Leads 	<ul style="list-style-type: none"> You may need to carry out a food waste survey to collect this data (see Section 3.2) May help with identifying nutrition lost
Number of patients served (by ward / department)	<ul style="list-style-type: none"> Meal ordering system report Demand forecasting data 	<ul style="list-style-type: none"> Catering Manager Housekeeping Leads; Nursing Leads; 	
Staffed available beds (by ward / department / healthcare facility)	<ul style="list-style-type: none"> Bed report 	<ul style="list-style-type: none"> Information services department 	

Table 1: Common sources of food waste data

You should keep track of all the different data you collect, its purpose and where it comes from. A data collection plan will help you capture all the information. The plan should be designed to reduce the effort required for data collection and keep track of where you are in the data collection process. Having this process documented can also assist in delegating responsibilities and transferring knowledge to others. The key areas include:

- **Frequency** – how often do you have to collect the data?
- **Data recording** – what format does the data come in?
- **Responsibility** – whose role is it to collect the data?
- **Status** – when was the latest data received, what action has been taken to collect data?

DATA FROM YOUR WASTE MANAGEMENT CONTRACTOR

Your waste contractor should be able to provide you with waste data. Establishing a good working relationship with your waste contractor is a key way of understanding the waste you produce. For each waste contractor you should have a contract or service level agreement. The document should contain a register of all the sites being serviced and the waste segregation systems in operation. It should also include information on: provision and ownership of containers; frequency of collections; charging structures including bin rental and maximum bin weight charges; and the contract renewal dates.

The NHS Scotland Domestic Waste Framework includes waste data reporting requirements. Contract review meetings with a representative from your waste contractor should take place regularly (ideally monthly, or as a minimum, quarterly). This should be accompanied by access to contract performance information in the form of a waste data dashboard (e.g. online portal, Microsoft Excel spreadsheet). The dashboard should provide a range of waste data for each site serviced including:

- Total weight of waste by site and waste stream
- Mode of disposal or recovery
- Proportion of waste sent for preparation for re-use, recycling or recovery
- Proportion of waste rejected due to contamination
- Cost of service including costs which are passed-through (e.g. landfill tax).

The data should be presented in a clear and concise format illustrating performance by site and the Health Board overall.

The provision of this data will enable you to keep an accurate measure for each location and by collection type, helping you to coordinate your service and enable the service to be correctly targeted and maximised.

It is important that you understand the source of the data to enable you to gauge its accuracy. On board weighing of bins is now widespread and this is the most accurate way of measuring the weight of collections from your facilities. Where weighing mechanisms are not used there are ways of calculating bin weights based on the container volume and contents. You should ask your contractor to make these calculations and to supply details of the methodology and assumptions.

You will also need to establish with your contractor if the data covers all waste collected from your sites. It is common for the larger waste management companies to subcontract waste collections and sometimes when this occurs, data is not supplied by sub-contractors. It is important to remember that these sub-contractors are often companies that focus on a single waste type (e.g. food waste) meaning that if their data is not supplied it will undermine the accuracy of the dashboard data.

Your waste contractor should also operate in accordance with the principles of Duty of Care. They should submit a Waste Transfer Note or Waste Transfer Note Season Ticket for all uplifts. The Waste Transfer Note should detail: waste segregation systems in operation; number, type and size of waste containers; and frequency of collection.

3.3 What about any data gaps?

Where the data is not available, or is not available in a useful format, you will either have to estimate the data or manually collect the data.

You can estimate the total weight of food waste by site by extracting information from your waste disposal invoices. Most invoices will provide the weight of food waste bins collected. If not, there will be information on the number of bin lifts and, while not as accurate as weights, these can also be used to estimate the total weight of food waste. It is important to remember that the weight or number of food waste bins will only provide information on the waste that is in them (i.e. food waste that is correctly segregated). It is common for significant volumes of food waste to be disposed of in residual waste bins.

In order to get accurate data on food waste, you need to look further than just your invoices. The best method to gather detailed food waste data is to carry out a food waste audit.

MOST INVOICES WILL PROVIDE THE WEIGHT OF FOOD WASTE BINS COLLECTED. IF NOT, THERE WILL BE INFORMATION ON THE NUMBER OF BIN LIFTS AND, WHILE NOT AS ACCURATE AS WEIGHTS, THESE CAN ALSO BE USED TO ESTIMATE THE TOTAL WEIGHT OF FOOD WASTE.



4 CONDUCT A FOOD WASTE AUDIT

Carrying out regular food waste audits can help develop a better picture of the food waste generated in your healthcare facilities, the quantity generated in different areas, why it is generated and how it can be reduced.

4.1 Review the food policies and procedures

Before commencing your audit, you should review any relevant documentation. Reviewing your Health Board's waste management policy, menu planning procedures, meal ordering procedures and food waste training in advance of carrying out the audit will help you to understand what should be happening within the hospital.

4.2 Undertake a food waste survey

A food waste survey can be used to:

- Record food waste by category (e.g. spoilage, unserved meals, plate waste) and weigh the waste.
- Record food waste by meal period (e.g. breakfast, lunch, evening meal).
- Identify food waste by dish type or food group (e.g. starter, main, pudding, protein, carbohydrate, vegetables).
- Identify which wards are producing the most food waste.

Ideally the food waste survey should be carried out for all food producing areas or, if resources are limited, in a selected number of representative areas. The selected areas should be representative of normal activity. You should compile a list of all of the areas that dispose of food waste and group the areas by floor or building to make it easier to identify the areas to visit.

The food waste survey should be undertaken on a typical day for a full day. Where resources allow repeat the survey for a full week or over a number of days as this will give a more realistic snapshot of the food waste.

Step 1 - Decide on the data collection approach

There are manual and automated methods for monitoring food waste. The best approach will depend on the size of your healthcare facility and the level of capital investment available. You should also consider the space needed to accommodate any equipment.

Automated data collection

An automated system basically links digital floor scales and the food waste bin with a tablet computer, allowing food waste to be quickly weighed. One of the benefits of the smart meter is that usually only one bin is needed as it can categorise the food waste (e.g. plate waste, unserved portions, spoilage) and give details about the specific items of wasted food. In addition, procurement data can be uploaded to the system, meaning that the smart meter is able to calculate the cost of the food being wasted. The smart meter approach is less labour intensive but does require a higher level of capital investment and Wi-fi connectivity. There are a number of commercial providers of automated data collection systems in the UK.

Manual data collection

Manual data collection does not need to be complicated. There are two main ways to manually measure food waste, the weighing method and the volume method. The weighing method involves collecting the food waste in containers and weighing the containers. If the catering department does not have access to accurate weighing scales, they should use the volume method. The volume method involves collecting the food waste in containers and then using the known volume of the containers to estimate the weight.

For the weighing method, the following equipment is required:



- Containers to collect the food waste (approximately 5-10 litres)
- Kitchen scales that can weigh up to 10kg
- Recording sheets.

For the volume method, the following equipment is required:

- Containers to collect the food waste (approximately 5-10 litres)
- If the size of the container is unknown, fill it up with water using a large measuring jug and record how many litres the container can hold
- Recording sheets.

Remember food waste can be heavy, so you should use containers that can be easily and safely lifted.

Step 2 - Train staff

It is important that all relevant staff understand why the food waste survey is being carried out and what is required of them. The survey process is designed to be simple and quick and to minimise any impact on staff activities. Staff required to participate will include catering staff, nurses and dietitians.

It is recommended that a briefing session is delivered to all relevant staff. The briefing should take place two days before the survey. Staff should be informed that they should not change any of their daily working practices or dispose of any food waste before the survey team has weighed it. A briefing session will

help reassure staff that the survey will only determine the quantity of waste generated in each area and that they are not being audited or checked.

Step 3 - Measure food waste

On the survey days, waste monitors should supervise all staff to ensure that food waste is being separated, weighed and recorded correctly on the monitoring sheets. The food delivery system should be considered when measuring food waste (e.g. bulk or plated) and where the food waste is disposed (e.g. central location or in wards). A number of waste bins should be positioned to collect the categories of food waste.

Waste bins may be needed to collect:

- Spoilage waste. This will need to include any spoilage from the main kitchen, ward kitchens and the food and drink retail units.
- Preparation waste from the main kitchen.
- Plate waste. This will need to include patient plate waste and plate waste from the hospital restaurant.
- Unserved meals from the wards and the hospital restaurant.
- Snack waste. This will need to include leftover food from patients snacks outside of mealtimes.

You will need to position the waste bins in the most practical location according to the layout of operations. You should use clearly labelled bins to make it easy for staff to identify what type of waste they should be putting into each bin. Depending on the amount of space available, or the size of the hospital, it might be the case that more than one bin is needed to collect the same type of waste.

IT IS RECOMMENDED THAT A BRIEFING SESSION IS DELIVERED TO ALL RELEVANT STAFF.

Figure 4, on the next page, provides an example of the location of bins for each category.

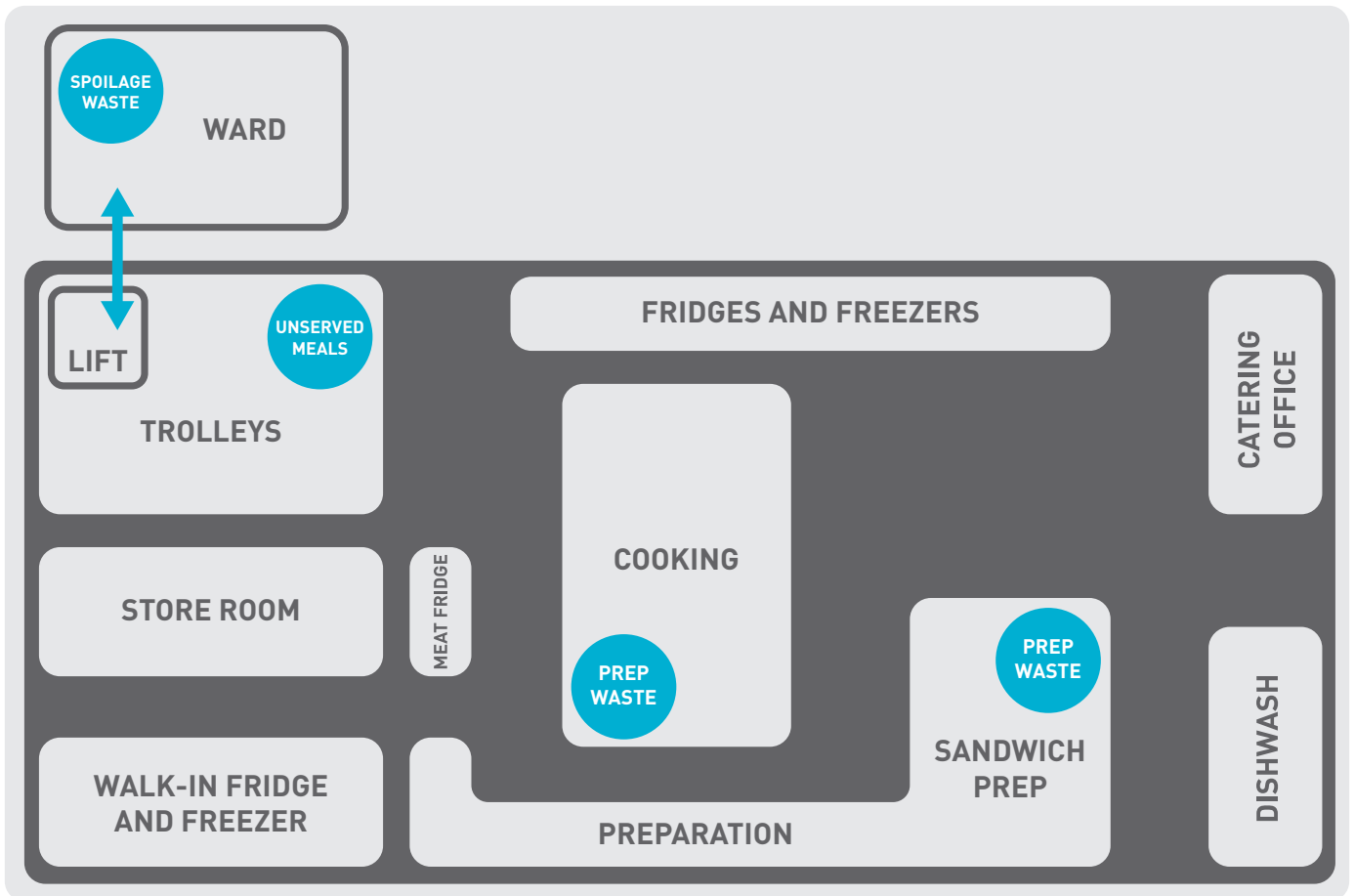


Figure 4: Location of food waste bins

All food waste should be separated, weighed and recorded correctly on the monitoring sheets.

In the main kitchen and ward kitchen:

- Collect, weigh and record any spoilage waste and preparation waste.

For meals provided in bulk or supplied from the ward kitchen:

- Weigh each bulk container of food provided to the ward. Record this quantity of prepared meals.
- After all of the meals are plated, re-weigh each bulk container of food. Record this quantity as unserved meals.
- For meal components supplied in bulk from the ward kitchen measure the weight of the container before the start of service and at the end of service, to determine the quantity of these foods provided.

For meals centrally plated and delivered to the wards:

- After the plated meals have been provided to the patients, record any unserved meals. Record the weight of these meals as unserved food.
- Ensure that all plates are collected from the patients and returned to the ward kitchen without being cleared. Check each plate and put aside any meals that are still sealed or have not been touched in any part. Record the weight of these meals as unserved food.
- Collect and weigh the food on the remaining patient plates. Scrape the food into a container and then weigh the container. Record this quantity as plate waste.

To help record the amount of food waste being generated, Zero Waste Scotland has developed a food waste data capture sheet which can be downloaded from the Zero Waste Scotland website.

4.3 Observe actual practices

A food waste survey can be used to:

- Record food waste by category (e.g. spoilage, unserved meals, plate waste) and weigh the waste.
- Record food waste by meal period (e.g. breakfast, lunch, evening meal).
- Identify food waste by dish type or food group (e.g. starter, main, pudding, protein, carbohydrate, vegetables).
- Identify which wards are producing the most food waste.

It is important that representatives from all relevant departments take part in conducting the survey. You should observe actual practices and staff behaviours, to see where the waste is coming from and compare this with the procedures that should be adhered to (e.g. ordering of 'just in case' meals, not checking stock levels before re-stocking, lack of adherence to Protected Mealtimes).

You should involve staff and ask them questions about where they think there is food wastage and why. For example, staff who serve patient meals and collect trays can provide insights into popular and unpopular menu items.

You will also be able to observe food waste segregation and assess whether any food waste is being disposed of in domestic or clinical waste bins.

The correct



disposal of food waste starts within each department and ward and requires proper understanding from all staff. Clearly labelled food waste bins should be provided in all ward kitchens and pantries, staff rooms, public areas of the restaurant and food and drink retail units. In addition, training is a vital component to ensure that staff are confident of their roles and responsibilities and how these relate to and incorporate good waste management practices.

4.4 Carry out a plate waste survey

It is often useful to separately monitor what type of food is returned on patient plates. Unusually high levels, trends or patterns in the types of food or menu items not consumed could indicate issues with portion sizes or other food related issues.

A plate waste survey, whilst respecting patients' privacy, requires some assistance from patients in understanding the reasons why food has not been eaten. It is recommended that a designated member of staff monitors a sample of meals served on a daily basis.

You should identify the reasons for plate waste, by speaking to patients or ward-based teams. Reasons for plate waste may include:

- Clinical (e.g. stress from medical treatment or poor appetite)
- Assistance (e.g. assistance with meal not provided)
- Environment (e.g. disturbances during the meal service)
- Meal service (e.g. poorly presented meals)
- Food issues (e.g. food is not served at the correct temperature, portion sizes are not appealing or appropriate for elderly patients).

4.5 Understand the results

With your data collected, the next stage is to analyse and evaluate the data to highlight any problems and identify areas for possible improvements and cost savings. Typically, you should focus efforts where the most waste is produced since this is likely where you will make the biggest financial savings.

In order to tackle food waste you need to understand the root cause for the food waste, identify the factors that contribute to it and the associated issues that exist in service delivery. It is often helpful to consider the main catering service areas and where in the hospital the waste arises (e.g. kitchen, ward). It is then possible to drill down into the specific factors rather than making generic observations such as ‘poor communication between catering staff and ward-based staff’.

The main catering service areas include:

- Menu and meal planning
- Patient meal ordering practices
- Food preparation and production

- Meal portioning and serving
- Stock control.

For example, if significant food waste is identified at the ward level then this may mean that the root causes are in patient meal ordering practices or meal portioning and serving practices.

Table 2 illustrates how you might analyse data from two wards that operate a centrally plated meal service. The data indicates that the hospital should focus on reducing unserved meals on the surgical assessment unit and establish why there is more waste on certain days for both wards.

	Ward 1 - Surgical assessment unit			Ward 2 – Minor surgery unit		
	Ordered meals	Unserved meals	Percentage unserved meals	Ordered meals	Unserved meals	Percentage unserved meals
Monday	30	2	6.7%	30	1	3.3%
Tuesday	30	2	6.7%	28	3	10.7%
Wednesday	30	8	26.7%	28	2	7.1%
Thursday	30	5	16.7%	26	2	7.7%
Friday	30	4	13.3%	28	2	7.1%
Saturday	30	9	30.0%	25	0	0.0%
Sunday	30	10	33.3%	25	0	0.0%
Total	210	40	19.0%	190	10	5.3%

Table 2: Food waste survey findings, unserved meals

Visualising the data in graphs and charts will make interpretation easier, helping you to understand what it means about Health Board’s performance and what can be done to improve it. Whilst it can be time consuming to analyse the data from multiple facilities and wards, it can often help to quickly identify possible opportunities.

Figure 5, on the next page, shows the quantity of food that was ordered and unserved following a lunch service. It can be clearly seen that the quantity of soup, baby carrots, rice and gravy was in excess of what was required by the ward.

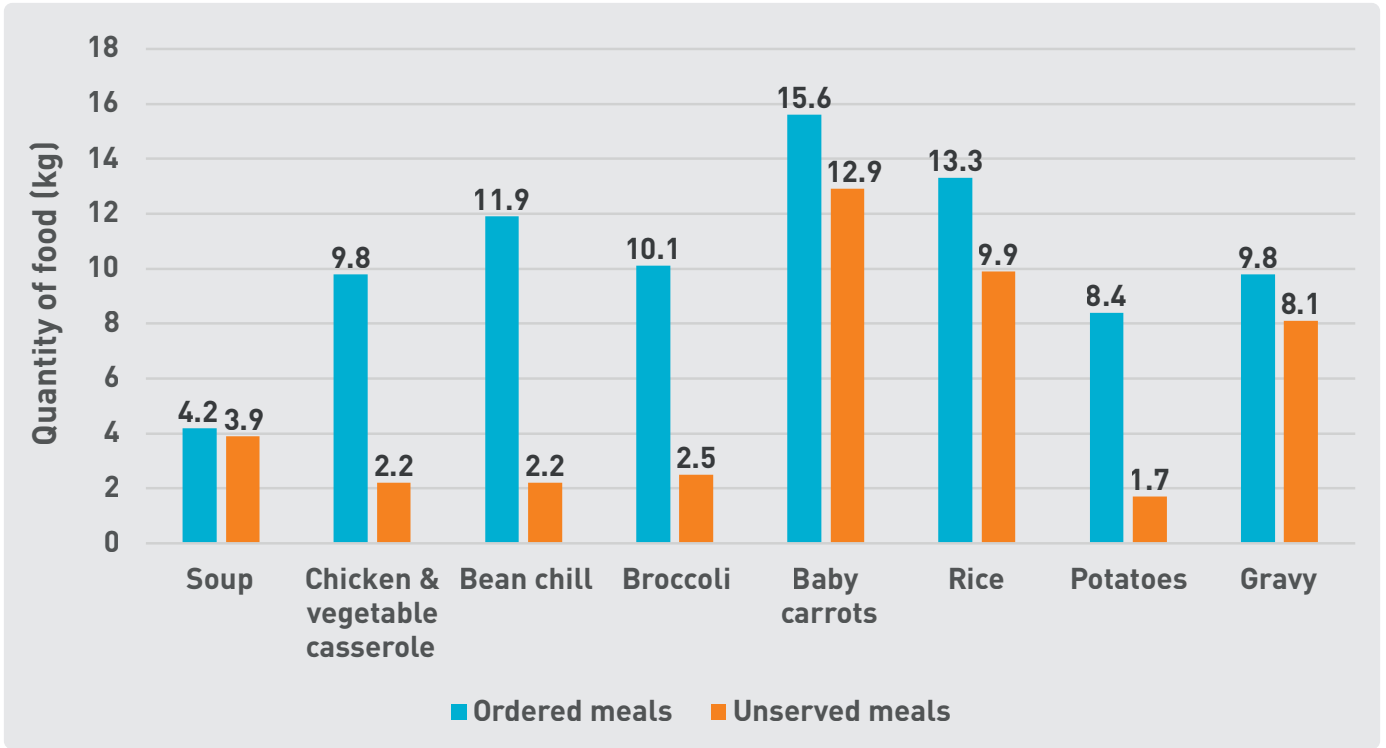


Figure 5: Food waste survey findings, unserved meals



5 DEVELOP AN ACTION PLAN

Having completed your audit, you can now review and prioritise all your opportunities and develop an action plan.

5.1 Identify potential solutions

You should discuss the findings of the food waste audit with other staff across all points in the customer food journey and explain you are looking for ways in which improvements can be made to reduce food waste. At this stage it is important not to point the finger of blame, you are gathering information in order to help make improvements and want to make sure that all staff are engaged in the process.

Although the management of food waste usually lies with the catering department, it is important to involve nursing and dietitian teams and those in retail settings in order

to understand why waste is happening and communicate the value in making changes that will reduce wastage.

COLLECTIVE WORKING BETWEEN TEAMS OFTEN PROVIDES THE BEST RESULTS, THROUGH SHARED UNDERSTANDING AND IMPLEMENTATION OF ANY CHANGES.

Table 3 identifies possible solutions to the potential root causes of waste.

Area	Potential root cause	Potential solutions
Meal and menu planning	Lack of consistency between patient and hospital restaurant menu	<ul style="list-style-type: none"> Align patient menus with hospital restaurant menus where possible
	Unsuitable menu for meal period, day of the week or season	<ul style="list-style-type: none"> Analyse till data from dining rooms and unserved food data from wards to identify poor sellers or overproduction Adjust menu and production accordingly to reflect demand
	Surplus perishable ingredients ordered for only one dish	<ul style="list-style-type: none"> Use up perishable items in more than one dish
Patient meal ordering practices	Kitchen starts production before receiving patient meal orders	<ul style="list-style-type: none"> Where possible, production should not commence until number of patient meals are confirmed If this is not possible, plan carefully using historical data as much as possible to forecast meal popularity and adjust production accordingly (e.g. number of patients)
	Meal orders not accurately translated into the quantity of food sent to a ward	<ul style="list-style-type: none"> Ensure that forms used to collate orders for a ward are easy to use, and training is provided to new starters Ward staff engage with catering team to accurately predict food required; ward teams to advise changes to catering teams as soon as possible to avoid over-production
	Lack of assistance provided to patients when completing menu choice forms	<ul style="list-style-type: none"> Provide patients with assistance where necessary

Table 3: Potential solutions to the root causes of food waste.

Area	Potential root cause	Potential solutions
Patient meal ordering practices	Guesswork in meal order for absent patients, uncommunicative patients or patients with other communication difficulties	<ul style="list-style-type: none"> • Provide alternative meal options for new patients or those who missed the meal order period (e.g. sandwiches, soup, meals from the hospital restaurant) • Actively discourage the ordering of meals for empty beds that may become occupied. Make sure ward staff know about the alternative meal options
Food preparation and production	Inaccurate demand forecasting in the hospital restaurant leading to over production of meals	<ul style="list-style-type: none"> • Analyse hospital restaurant till to forecast likely number of meals required • Consider putting out less food at the start of a hospital restaurant service and replenishing more often
	Cooking a large number of portions towards the end of a restaurant service	<ul style="list-style-type: none"> • Allow items to 'run out' towards end of service, providing there are alternative choices available • Cook to order towards the end of service instead of a batch cook
	Familiarity with recipes means ingredients 'weighed' by eye	<ul style="list-style-type: none"> • Encourage chefs to weigh ingredients or use pre-weighed packs in recipes
	Limited number of batch size recipe sheets	<ul style="list-style-type: none"> • Development of additional recipe sheets for intermediate quantities to allow chefs to work to a recipe, rather than just adding a bit more or less for intermediate quantities
	Making up of gravy and custard without reviewing menu	<ul style="list-style-type: none"> • Review menu in relation to gravy and custard to match demand
	Overproduction of porridge resulting in large quantities being returned to the kitchen	<ul style="list-style-type: none"> • Reduce the amount of porridge prepared for wards that repeatedly return porridge waste to the main kitchen
Meal portioning and serving	Lack of understanding on size of normal and small portions	<ul style="list-style-type: none"> • Provide refresher training sessions on what constitutes a normal and small portion • Provide appropriate serving utensils • Pre-portion dishes in bulk food containers to ensure the correct portion size is given
	Filling bulk containers of prepared food by eye	<ul style="list-style-type: none"> • Determine how many portions a container can hold and weigh food into containers
Stock control	Overstocked ward fridges	<ul style="list-style-type: none"> • Provide training on stock control of ward fridges • Only retain minimum stock levels • Regular monitoring of stock levels by supervisors

Area	Potential root cause	Potential solutions
Stock control	Poor stock control in central kitchens fridges and freezers	<ul style="list-style-type: none"> • Check the temperature of equipment regularly. • Rotate the stock – first in, first out • Use date/day colour stickers for prepared or opened items
	High spoilage rate of perishable items	<ul style="list-style-type: none"> • Forecast stock requirements and do not purchase more than required • Adjust purchasing based on historical data and any changes in the menu
	Poor quality fresh ingredients delivered by suppliers	<ul style="list-style-type: none"> • Check all food deliveries and return any products that do not meet standards

5.2 Develop an action plan

Once you have agreed the solutions, you should develop a costed action plan. This will allow you to compare the cost/benefit of each solution and assess its priority, and ultimately whether your Health Board will implement the actions. Your action plan should set out:

- Proposed priority improvement measures
- Key implementation steps for each measure
- Potential financial and environmental savings
- Estimated cost (e.g. staff time, capital cost)
- Team roles and responsibilities
- Training or communications to support the improvement measure
- Timescales.

Implementing the action plan will involve teamwork. In some cases, you may need to produce detailed implementation plans for specific improvement projects or specific facilities within your overall action plan. It is important to get everyone involved in implementation and to keep people informed about progress.

5.3 Set KPIs

It is important to keep measuring food waste when you implement your plan. Including KPIs in the business case will demonstrate how you plan to track the performance of your action plan and demonstrate the benefits of implementing the plan. Measuring food waste

against Key Performance Indicators (KPIs) will allow you to measure the success of your action plan. The KPIs will also further your understanding of how and where food waste is generated.

Table 4 details examples of KPIs to measure progress being made to reduce the amount of food being wasted and the data sources needed to report against them. You could set KPIs for specific wards, facilities or for the overall Health Board.

To start with, select one or two KPIs to report against and for each select an appropriate time period for measurement (e.g. daily, weekly or monthly). You will also need to



consider what other factors may influence the numbers to be able to put them into context, for example if new wards are built and patient numbers increase, the total amount of food

waste is also likely to increase. The KPIs will tell you whether the relative amount of food waste per patient is increasing or decreasing.

Area	Potential root cause
Patient associated food waste (kg per patient per day)	<ul style="list-style-type: none"> • Number of main dish portions unserved • Average weight of a main dish portion • Amount of unserved carbohydrate products (e.g. potato, pasta, rice) by weight in kg per patient⁴ • Amount of unserved vegetables by weight in kg per patient • Amount of unserved desserts/pudding by weight in kg per patient • Amount of food left on plates by patients by weight in kg per patient
Percentage of unserved portions compared to ordered portions	<ul style="list-style-type: none"> • Number of main dish portion ordered • Number of main dish portions unserved
Percentage of unserved portions per patient on ward	<ul style="list-style-type: none"> • Number of patients at the time of ordering (less nil by mouth) • Number of main dish portions unserved
Spoilage associated food waste (kg per patient per day)	<ul style="list-style-type: none"> • Amount of spoilage food waste by weight in kg per patient
Preparation associated food waste (kg per day) per served meal	<ul style="list-style-type: none"> • Amount of preparation food waste by weight in kg per patient
Restaurant associated food waste (kg per cover or transaction)	<ul style="list-style-type: none"> • The amount of food waste arising in the restaurant in kg each day • Number of covers or number of transactions
Spoilage associated food waste from the restaurant (kg per cover or transaction)	<ul style="list-style-type: none"> • Amount of spoilage food waste by weight in kg per patient
Preparation associated food waste from the restaurant (kg per cover or transaction)	<ul style="list-style-type: none"> • Amount of preparation food waste by weight in kg per cover or transaction
Plate waste food waste from the restaurant (kg per cover or transaction)	<ul style="list-style-type: none"> • Amount of plate waste by weight in kg per cover or transaction

⁴Dependent on the nutrition interest, you can gather data on other key food groups (e.g. protein, dairy)

5.4 Use benchmarks

Benchmarking is an excellent method to track food waste over time, or to compare one healthcare facility to another. Benchmarking in the healthcare sector is typically based on the number of patient bed days (or inpatient bed days). By dividing the total food waste generated in your facility per month (or per annum) by the number of patient bed days for that month (or year), you will generate a waste benchmark for your facility.

You can carry out internal benchmarking with other facilities within the Health Board.

You can also carry out external benchmarking with other Health Boards. The benchmarks should be reported to the Health Facilities Scotland Catering Advisory Group and Zero Waste Scotland to support external benchmarking with other Health Boards.



6 PRESENT YOUR BUSINESS CASE

Once you have developed your action plan, it is likely that there will be some no-cost and low-cost projects that you can begin to implement straight away. It is also likely that there will be some projects that will require more staff resourcing or financial investment before

work can commence and savings can be achieved. Sometimes a simple write up of your recommendations in a food waste mapping report, as shown below, may be sufficient to secure staff resourcing or financial investment.

EXAMPLE STRUCTURE FOR FOOD WASTE MAPPING REPORT

1

SUMMARY

- A brief introduction to the food waste mapping exercise, the results and identified opportunities.
- The food waste action plan.

2

INTRODUCTION

- A summary of the regulatory, economic and environmental drivers
- Comparison of food waste data against any available benchmarks or KPIs
- Any organisation and context specific issues to be borne in mind when considering report recommendations

3

FOOD WASTE SURVEY FINDINGS

- Detailed discussion of findings

4

RECOMMENDATIONS

- A summary of the specific actions to be taken
- Who has the lead responsibility
- Estimated costs and benefits
- Potential risks and any alternative options
- Timescales
- Next steps

5

APPENDICES

- Data gathered during the survey (may be links to the data or spreadsheets rather than actual data)
- If needed, detailed calculations of costs and benefits
- Any other relevant information

However, in other circumstances, and particularly where significant financial investment is being sought, a more formal business case may be required. Zero Waste

Scotland can provide specialist advice and support to help you prepare a robust business case to support your food waste prevention action plan.

7 IMPLEMENTING THE ACTION PLAN

Some of the measures may be relatively easy to implement without the need for a trial period. However, it is often best to trial measures that require a change in procedure or the involvement of a wider range of stakeholders. Before conducting a trial, you will need to identify:

- Key stakeholders to involve (e.g. chefs, ward-based staff, dietitians)
- Key messages to communicate to stakeholders
- Data collection requirements to monitor the trial.

If your trial is successful in reducing food waste, you should implement the measure across the rest of the hospital or Health Board. Before you do this, you should recognise the efforts of those involved in the trial, share the results with them and gather any feedback or lessons learned. Their experiences will help you develop your plan for the wider implementation of the food waste reduction measure.





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