

BUFFET TOOLKIT

Building an Understanding
For Food Excess in Tourism

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CONTENTS

INTRODUCTION	3
CHALLENGE: ORGANISATIONAL BUY-IN	5
SOLUTION A: MAKE A BUSINESS CASE	5
SOLUTION B: DEVELOP A POLICY	8
SOLUTION C: INVOLVE STAFF	10
CHALLENGE: DON'T KNOW WHERE TO START	12
SOLUTION A: MEASURE IT	12
SOLUTION B: CREATE A WASTE MAP	13
CHALLENGE: TOO MUCH FOOD WASTE!	17
SOLUTION A: OPTIMISE PROCUREMENT AND INVENTORY MANAGEMENT	17
SOLUTION B: STREAMLINE DELIVERIES	19
SOLUTION C: SOURCE LOCALLY AND SEASONALLY	20
SOLUTION D: PROPER STORAGE AND EXTENDING SHELF LIFE	21
SOLUTION E: MENU PLANNING	22
CHALLENGE: PREPARATION WASTE	25
SOLUTION: MANAGING FOOD PREP	25
CHALLENGE: OVERPRODUCTION	26
SOLUTION A: CONSIDERING TYPES OF SERVICE	26
SOLUTION B: MANAGING A BUFFET	27
CHALLENGE: PLATE SCRAPINGS	28
SOLUTION A: PORTION CONTROL	28
SOLUTION B: SERVICE AND PRESENTATION	29
SOLUTION C: COMMUNICATING WITH GUESTS	29
CHALLENGE: WHAT TO DO WITH WASTE	31
SOLUTION A: RESCUE, REUSE AND REDISTRIBUTION	31
SOLUTION B: CONTACT LAWMAKERS	33
SOLUTION C: ESTABLISH NETWORKS	34
SOLUTION D: DISPOSAL	35
REFERENCES	36

INTRODUCTION



We recognise that there are many challenges and barriers to implementing food waste reduction practices in hospitality and food and beverage operations. Perhaps implementing such changes are too expensive, or there is a lack of space; perhaps the infrastructure in your property or municipality is not conducive to reducing food waste to landfill, or perhaps you simply don't know where to start.

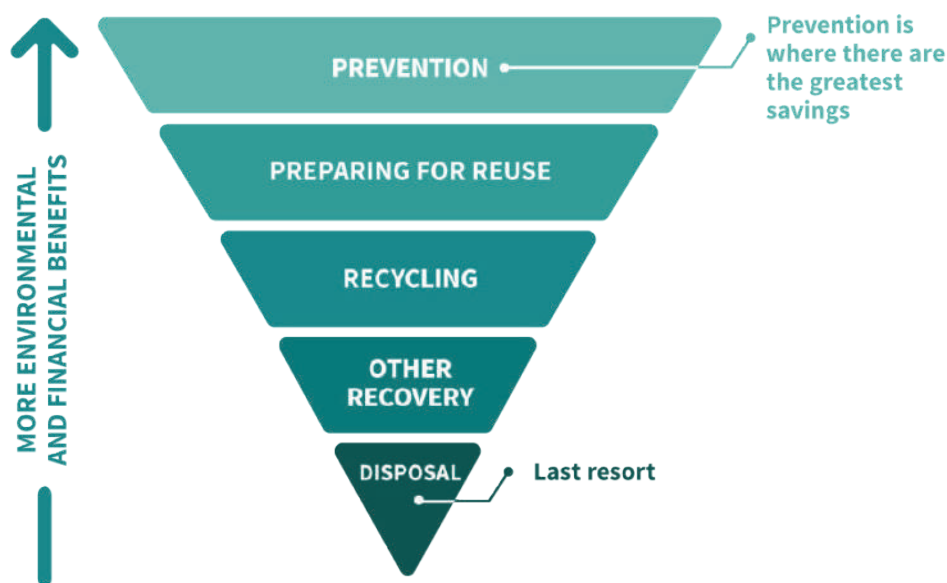
There are indeed many ways to tackle reduce food waste in hospitality F&B operations – go with what works for you.

Here are a few waste mapping and reduction methodologies to consider:

- UNEP's guidance for implementing a W.A.S.T.E. project to prevent and reduce food waste in the food and drink business supply chain (Module 4) ([UNEP, 2014](#))
- The Travel Foundation's guide to creating a waste map ([The Travel Foundation, 2013](#))
- WRAP's four steps for hotels to take action on waste ([WRAP, n.d.d.](#); [Green Hotelier \(ITP\), 2014](#))
- Futouris' step-by-step guide on waste management as part of their *Sustainable Food Manual* ([Futouris e.V., n.d.](#))



This resource presents some possible solutions to challenges you may face when working to reduce food waste. If you have further questions or need assistance getting started, please don't hesitate to [contact us](#). We are here to help!



The food waste management hierarchy shows food waste management options in order of most to least environmentally and economically favourable.

Indeed, some food waste is inevitable. For example, bones are an inevitable consequence of eating meat and while they can be utilised for a second purpose such as making stock, the bones themselves will eventually need to be composted. Food waste of this type is categorised as unavoidable. Unavoidable food waste is estimated to account for approximately 25% of all food waste that arises from hospitality, food service and food retail outlets in the UK. This means that the remaining 75% of food waste is avoidable.

([WRAP, n.d.b](#))

CHALLENGE: ORGANISATIONAL BUY-IN

In order to avoid or reduce excess food waste, you first need to acknowledge that there is a need for improvement and commitment to sustainability and reducing food waste within your organisation. It may take your management or team a little convincing. Be sure to have a dedicated individual who can be a champion for managing food waste in the organisation.



Solution A: Make a business case

Make the business case for reducing food waste. While it may seem like common sense that reducing excess food waste can make a positive impact on an organisation's bottom line, sometimes a little research is necessary to make the case.

- Find out how much you could be saving annually with [WRAP's \(n.d.g\) simple calculator tool](#).
- Watch some [videos from WRAP](#) (2017) about how your business can save money by saving food.

The Singapore food waste minimisation guidebook ([NEA and AVA, 2017, p.2](#)) states succinctly: "Identifying the sources of food waste can uncover inefficiencies in the workplace, such as the wastage of raw materials. For businesses, it makes economic sense to reduce wastage of raw materials that are bought. Not only would there be material cost savings; there would also be savings on disposal fees resulting from less waste. This will ultimately translate to an increase in profits."

According to Pirani and Arafat (2014), effective waste management in a hotel can reduce waste production by 75% (see their journal article: [Solid waste management in the hospitality industry: A review](#)). They go on to say, "more efficient waste management can help lead to significant savings for the business depending on where the business is located and the waste management regulations in that area" (p.321).

Some benefits of effective food waste management include:

- An improved business image
- Reduced carbon emissions from the decreased transportation of waste
- Reduced costs due to smaller and more streamlined order requirements
- Reduced waste disposal costs leading to increased profits
- Possibility for tax deductions and other fiscal incentives
- Re-use of non-edible food waste can sometimes be monetised when used for secondary purposes (e.g. animal feed)
- Improved relations with stakeholders, including the local community through the concrete demonstration of CSR practices
- Reduced risks and liabilities
- Health and safety benefits (e.g. pest reduction, reduced odour emissions from garbage, more sanitary streets in your community)
- Increased employee morale

According to a study conducted by [WRAP and WRI \(Hanson and Mitchell, 2017\)](#), for every US\$1 (or other relevant currency) invested in food loss and waste reduction, the median company realised a US\$14 return. Companies with the highest returns tended to be restaurants. Hotels, food service companies, and food retailers tended to have ROI ratios between 5:1 and 10:1.

Although little literature is available on food waste management in the hospitality industry ([Pirani and Arafat, 2014](#)), and even less is available on the Asia Pacific region in particular, according to [Green Hotelier \(ITP\) \(2014\)](#).

In terms of a business' image, it is interesting to note that, according to a [Unilever \(2011\) report](#), “Globally, 84% of respondents stated that they are concerned with the amount of food that is thrown away every day in out-of-home dining establishments. The concern appears to be even higher in China, Brazil and Turkey”(n.p.).

The report further found that 81% of Chinese respondents would be prepared to pay more for meals in places that are employing environmentally-friendly food waste disposal schemes. This was the highest percentage amongst nations surveyed.

The Unilever (2011) report concluded that, “there are clear benefits for the industry itself: reduced food waste means a reduction in disposal costs, increased kitchen efficiency, and ultimately, a reduction in the foodservice's carbon footprint” (n.p.).

Read more about making the [business case for food waste](#) by Hanson and Mitchell (2017) from WRI and WRAP.

Some astounding facts about food waste:

- The United Nations' Food and Agriculture Organisation ([FAO, 2011](#)) states that every year consumers in industrialised countries waste approximately 222 million tonnes of food, which is almost as much as the entire net food production of sub-Saharan Africa.
- UN Environment estimates that 1.3 billion tonnes of food is wasted every year. Preventing it could mean feeding all undernourished people in the world twice over ([UN Environment, 2017](#)).
- In 2016, 791,000 tonnes of food waste was generated in Singapore. This accounted for 10% of the total waste generated in the country. ([NEA and AVA, 2017, p.1](#))
- Roughly one-third of the food produced worldwide for human consumption is lost or wasted, when one-fourth would be enough to eradicate world hunger (FAO, as cited in [HOTREC, 2017](#)).
- The UK wastes 1.9 metric tonnes of food and drink a year; 1.1 metric tonnes of this is avoidable, worth £1.9 (~\$US2.6) billion. There is, however, 700,000 tonnes of food and drink surplus either being redistributed or diverted for the production of animal feed ([WRAP, 2015b](#)).
- Food waste costs the UK hospitality and food service sector £2.5 (~\$US3.3) billion, the equivalent to £10,000 (~\$US13,128) for each business unit ([WRAP, 2013c](#)).
- The global carbon footprint of wasted food has been estimated as more than twice the total greenhouse gas emissions of all road transportation in the US in 2010 ([FAO, 2013](#)).
- The cost of food waste in the US is US\$165 billion ([Buzby and Hyman, 2012](#)).





To give some context:

“The amount of food that is wasted each year in the UK is equivalent to 1.3 billion meals, or one in six of the 8 billion meals served each year” (WRAP, 2013b, p. 3). “Around 6% of all food waste arising in the UK comes from the hospitality and food service sector. [...] The environmental costs of food waste include water wastage through embedded water present in food waste and greenhouse gas emissions, especially methane, which is created when food waste is sent to landfill [...]. The business case for reducing food waste is compelling: food waste costs UK hotels on average, £0.52 [(~US\$0.68)] per meal (WRAP 2014)” (WRAP, 2013b).

In the UK, food waste represents a cost to the hotel sector of £318 (~US\$417) million each year including food procurement, labour, utilities and waste management costs, or £4,000 (~US\$5,255) per tonne (WRAP, 2013b). A significant proportion of this waste is avoidable. It is thus evident that an approach based on preventing waste in the hotel business offers the opportunity to deliver significant cost reductions throughout the food handling process from initial procurement through to disposal” (WRAP, 2013b).

Solution B: Develop a policy

Start by developing a sustainability policy for your own organisation (see [example of PATA's Sustainability Policy](#)), and be sure to include your commitment to sustainable food and waste management in your mission statement, as well as throughout your organisational strategies.

You may develop a food waste policy for your organisation, either separate from, or as part of your sustainability policy. Either way, “from a sustainability perspective, the improvement of waste management practices of the hospitality industry is a pivotal part of its overall green strategy. This issue must be addressed not only by the staff of the establishments at the different stages of operation (front-of-house, back-of-house, etc.), but also the administration must draw out strategies which would encourage guests to generate less waste” (Pirani and Arafat, 2014, p.322).

UN Environment further suggests to embed targets as key performance indicators (KPIs) in operations, supply chain management, and for employees (UNEP, 2014).



You may also wish to develop your own sustainable purchasing policy. A helpful tool, “[A Guide to Developing a Sustainable Food Purchasing Policy](#)” is available for download from sustainablefoodpolicy.org.

Remember that communicating your position with external stakeholders is key to your commitment to sustainable practices throughout your organisation, and will also help to mainstream sustainability in our industry. Communicating your position will also help to show leadership, differentiate you from your competitors, and boost your brand image.

For further information about developing a [sustainable purchasing policy](#), and ideas on questions to ask suppliers, visit ITP’s [GreenHotelier.org](https://www.greenhotelier.org).

Example: PATA is working to include a clause in our partnership agreements that make sure our partners and suppliers share our same values:

What to include in your sustainability policy:

- Your organisation’s mission in relation to sustainability
- Your organisation’s commitment to sustainability and how you demonstrate/ aim to demonstrate it
- Your organisation’s scope
- Your organisation’s relationship with existing/ potential environmental and social impacts relative to its location, local environment, and scale of services provided.

([EarthCheck, 2012](#))

In line with our [sustainability statement and policy](#), PATA aims to conduct our business in a socially responsible and ethical manner, in a way that is good for people, planet, and profit. We encourage our partners and suppliers to work with us to leave a positive impact on the surrounding environments in which we operate by:

1. Guaranteeing compliance with national and international regulations in all relevant aspects, including those relating to the workplace and the environment.
2. Promote and respect human rights, including non-discrimination, health and safety, fair wages, and, in particular, the rights of children.
3. Reject and condemn the exploitation of people, in any of its forms, especially sexual and in particular when it affects minors.
4. Make good use of natural and local resources, reducing negative environmental impact, minimising the consumption of resources, and maximising positive community impact.

PATA asks that our partners and suppliers strive to comply with the commitments above in acknowledgment of our collective responsibility towards society to be good corporate citizens.

Solution C: Involve staff

As part of your sustainable food operations, obtaining and maintaining staff buy-in is critical ([WRAP, n.d.c](#)): Setting goals and explaining the benefits to everyone will help them to understand why changes are necessary.

Making sure that everyone is involved and on board also helps to mainstream the process and makes implementing food waste measures easier. Be sure to communicate clearly with staff, to not only increase awareness but also encourage dialogue. Getting staff involved will bring about a sense of ownership. Providing visual aids such as posters throughout the kitchen can also help promote behaviour change. Keep staff motivated by setting SMART food waste reduction goals.



These practices should not only be communicated with kitchen teams, but also service teams, housekeeping, gardening, engineering, purchasing, receiving, and security, as all departments can contribute to making a difference. Housekeeping, for example, can help with reducing or reusing gifted fruit baskets, etc.

A key factor for organisations is staff training. This includes: meetings and presentations with Q&A on the total program and audit, and involves members from multiple relevant departments, who are given hands-on training from the beginning.

Off-site visits can be conducted to make the mission and reasons why tackling food waste is imperative. Suggestions for off-site visits include taking staff to visit composting sites, farms, and landfills, or [volunteering by riding along in a food truck to donate food in the community](#).

Further reading:

- Futouris e.V. (n.d.) suggests in its [Sustainable Food Manual](#) to: “Create awareness among staff members of the importance and benefits of sustainable food operations in order to gain the support of as many staff as possible. Train your staff well on all aspects of sustainable food operations in order to be able to continuously innovate and improve operations Stimulate the change process and encourage management and staff members to continuously innovate and move operations towards more sustainability.”
- UN Environment’s (2014) [Prevention and reduction of food and drink waste in businesses and households- Guidance for governments, local authorities, businesses and other organisations](#), presents a typical team structure and responsibility table in Module 4, page 106.
- [Read more about forming a ‘Green Team.’](#)
- Our partner, [Green Hotelier \(ITP\)](#) has a great article (2013) about [increasing employee engagement](#) in the context of recycling.
- Tracking waste and using posters to help staff to categorise their waste will reinforce messages. Watch videos, access a toolkit and Quick Start Guide via [WRAP \(n.d.g\)](#): “Your Business is Food; don’t throw it away!”



Tackling sustainability issues is daunting. Being overwhelmed about food waste is completely understandable. Knowing where to start can be a huge hurdle, so here are some suggested solutions!

Start by measuring your food waste. In doing so, you can better manage it by identifying how much waste is generated and where it comes from. This can help to identify causes of the waste and ways to prevent it. To take a line from our good friends at [EarthCheck](#), you can't manage what you don't measure!

Green Hotelier (ITP) suggests:

“For a trial period, e.g. a week, start collecting food waste in three separate bins (one each for preparation, spoilage and plate waste), where appropriate, to understand where and why this waste arises. Weigh them daily to find out where the most food waste is being generated. This should include food that would otherwise have ended up in the sink disposal unit. Remember that this is going to present a challenge to staff to do things differently so preparation is key – make sure staff understand why you are doing this and get on board” ([Green Hotelier \(ITP\), 2014](#)).

You can record your waste on a food waste tracking sheet, available via [WRAP \(2015a\)](#) or [US EPA \(2015\)](#). For more detail, [Unilever's Wise up on waste](#) is an app for professional kitchens to conveniently monitor and track food waste, including monitoring the composition of plate waste. We recommend you go this extra step; if you are wasting a lot of meat, this is costing you a lot of money!

Audit Period (week/month):												
Location/ Area:												
Date	Time	Recorded by	Description of food waste (e.g. vegetable trimmings, chicken/ fish bones)	Amount (kg)	Sources of food waste (to tick)					Amount of food redistributed (kg)	Amount of food waste treated/ recycled (kg)	Amount of food waste disposed of (kg)
					Preparation waste	Over-production	Spoilt / Expired products	Plate waste	Others, please state			
TOTAL					TOTAL							
Recipient(s) of redistributed food:												
Treatment/recycling of food waste (e.g. on-site food waste treatment to convert to compost, recycling into animal feed):												

ANNEXES

12 — BUFFET Toolkit — A PATA food waste reduction initiative

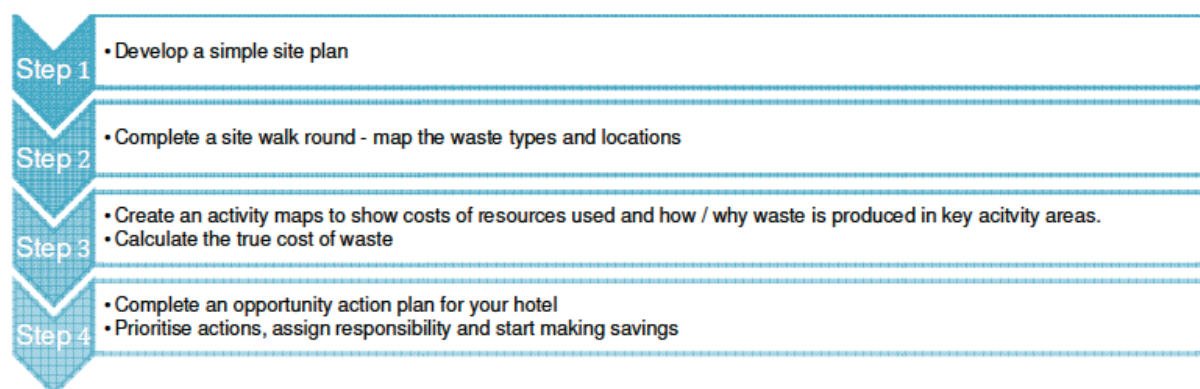
These sheets help to give standard metrics to help measure your waste. Once you've obtained your baseline, you can then set goals to track your achievement over time in terms of weight or volume, and in financial value. You may also wish to tackle certain areas first, for example, the buffet, where you can reduce prepared portions, and select foods that can be made quickly as needed, instead of pre-making too much.

Finally, setting and re-setting goals, engaging staff, as well as reporting on progress will help in the learning and celebration process.

For information on how to conduct your own waste audit, please see foodsave.org's [DIY Waste Audit](#).

Solution B: Create a waste map

Hotel Waste Mapping Guide



(The Travel Foundation, 2013, p.i)

Understanding the type and source of food waste produced from the food and beverage area is very important. At minimum you should aim to quantify total food waste, but measuring the type and source of food waste from all stages of food preparation and service is recommended.

- **Spoilage of raw materials:** anything from the kitchen that is not suitable for use, e.g. bruised or mouldy potatoes, spoiled produce, goods that are damaged/past expiry date;
- **Preparation waste:** anything that is not for human consumption and usually thrown out, e.g. potato peelings, cut offs, dropped/burnt food, meat/fish bones etc.;
- **Overproduced food:** i.e. prepared food portions that have not been sold/ consumed – including leftover buffet waste; and,
- **Plate scrapings** from customers.



L-R: Spoilage of raw materials, preparation waste, overproduced food, plate scrapings.

Involvement of staff in mapping food waste can help identify opportunities to reduce waste, get them involved and invested in the project, and help them understand why and how to reduce food waste.

Step 1: Develop a simple site plan

- Obtain or draw a map of your site
- Be sure the site map includes both back of house and front of house areas, such as:
 - o Refrigeration and storage
 - o Raw food prep areas
 - o Cooking areas
 - o Dishwashing

Step 2: Complete a site walk round – map the waste types and locations

- Populate your site plan with information on waste and resource use
- As you complete your walk round:
 - o Look for areas where waste is being produced (e.g. storage, production, over production, guest plate)
 - o Identify how waste is currently being handled
 - o Mark areas of waste production on the site plan
 - o Make note of the type of waste generated and if possible, its composition (e.g. food spoilage, over production, inedible waste, edible waste; whether waste is meat, vegetables, bread, etc.)
 - o Identify the source of the waste
 - o Identify if waste is garbage or whether it can be separated for recycling/reuse/composting
 - o Take photographs to document
 - o Note the number and placement of bins in each area, along with their volume and collection frequency
 - o Remember to talk to key staff including area managers during the walk around about waste they dispose
 - o Be sure to also record the date and time you completed the audit, as volumes may be different at different days of the week/times of the day

Step 3: Create an activity map to show costs of resources used and how/why waste is produced in key activity areas. Calculate the true cost of waste.

View this [video](#) to see how the Sofitel Bangkok Sukhumvit saved over US\$60,000 by reducing food waste. ([Winnow Solutions, n.d.](#)). [Read the case study here.](#)

Place waste bins next to the type of food waste you are measuring: one in the stock room and next to the refrigerator for spoiled food; one in the kitchen next to food prep area for egg shells, vegetable seeds, and other inedible foods that can be composted; one behind the serving area for overproduced food; and one in the pot washing area and/or where dishes are scraped.

Having separate bins in these areas ensures that waste is separated upstream, and makes it easier to quantify where the most food is being thrown out. Quantifying and identifying where food is wasted can help to make adjustments to purchasing, menu planning, and service.

Note: you will need set of bench scales to place in quick prep areas, and larger floor scales to weigh the waste.



Be sure to analyse the composition of your waste, report on it, and repeat audits regularly. You may also consider using technology to help your staff with measuring, analysing and reporting food waste in order to reduce food waste in your kitchen and simultaneously your costs.

Utilise this example chart below to record the weight/volume of food thrown out, and be sure to record waste at every meal for at least three days.

Meal time/type		[e.g. dinner all you can eat buffet]					
# of meals served/ covers		[e.g. 150]					
Spoilage (kg)		Prep waste (kg)		Overproduced food (kg)		Plate scrapings (kg)	
Total spoilage	5	Total prep waste	6	Total over production	7	Total plate scrapings	8
Spoilage/ cover	$5/150=.03$	Prep waste/ cover	$6/150=.04$	Over production waste/cover	$7/150=.047$	Plate scrapings/ cover	$8/150=.053$
Total waste (kg)		$5+6+7+8=26$					
Total waste per cover (kg)		$26/150=.173$					

Once you have completed this chart, you will be able to identify the following:

- Which meal produces the most waste
- Which area produces the most waste
- Types of food waste produced.

To calculate the true cost of food waste, it is essential to determine a more accurate cost of waste by taking into account product cost, labour, and utility usage.

You may utilise the formulas below to help calculate the true cost of food waste.

Calculate the cost of food waste

$$\text{Average cost per kg of food} = \frac{\text{Total cost of food}}{\text{Total weight of food}}$$

$$\text{Average cost per meal} = \frac{\text{Total cost of food}}{\text{\# of meals}}$$

$$\text{Daily utility costs} = \frac{\text{Total utility costs per month} \times 12}{365}$$

$$\text{Cost for producing meals daily} = \text{total food cost} + \text{total labour cost} + \text{daily utility costs}$$

Results from food mapping audit:

$$\begin{aligned} \text{Food waste} = & \text{Daily kg of spoilage} \\ & \text{Daily kg of food prep waste} \\ & \text{Daily kg of overproduction waste} \\ & + \frac{\text{Daily kg of plate scrapings}}{\text{Total kg of food waste}} \end{aligned}$$

$$\text{True cost of food waste per day} = \text{total kg of food waste} \times \text{ave. cost per kg of food}$$

$$\text{Wasted food costs per meal} = \frac{\text{true cost of food per day}}{\text{\# of meals}}$$

$$\text{Cost per meal} = \frac{\text{Cost for producing meals daily}}{\text{\# of meals}}$$

$$\% \text{ of meal cost wasted} = \frac{\text{wasted food costs per meal}}{\text{cost per meal}} \times 100$$

Step 4: Identifying and prioritising opportunities

Now that you know:

- Which areas produce the most waste
- Which meal produces the most waste
- The types of food waste produced; and
- The cost of waste in both general and in different areas of the kitchen

... you can use this information to take action to reduce waste, and realise financial savings alongside environmental benefits.

Remember also, that using this data can be helpful to identify main areas of waste. You may use this information to decide which area to target: 'low-hanging fruit,' big impact areas, big opportunities for preventing food waste. Don't feel as if you have to tackle everything all at once.

Tips for easy management:

- Be sure to segregate food waste in to separate bins for spoilage, preparation, overproduction, and plate waste
- Colour code bins for easy training of staff and clear segregation ([Pirani and Arafat, 2014](#))
- Monitor what food is left on plates or at the buffet and try to obtain some customer feedback to determine the reason why it was not eaten. Results can impact menu planning ([Futouris e.V., n.d.](#))
- Implement online surveys or guest satisfaction survey cards that accompany the check at the end of the meal. Consider implementing loyalty points or other incentives to encourage guests to complete survey

Case study: *Waste Mapping Guidance for Hotels in Cyprus: Saving money and improving the environment* ([The Travel Foundation, 2013](#)). This report also has wonderful printable resources for steps 2, 3, and 4 on pages 40, 44, 56-58, and 62.



CHALLENGE: TOO MUCH FOOD WASTE!

Yes, the challenge is that there is too much food waste (and general waste) in the kitchen. Below, you will find various suggested solutions to challenges you will meet when trying to reduce waste throughout your dining establishment. From procurement and sourcing, delivery, to storage and menu planning, we hope these tips will help you take action in your kitchen!

To get you started, check out [this interactive resource from WRAP \(n.d.c\)](#), which includes fantastic tips on measuring, purchasing, storage, prep, portioning, and recycling.

Solution A: Optimise procurement and inventory management

Review your waste audit to see what types of items spoil the most. Using that information, you may adjust the quantity or frequency of purchasing for these items. This information can also help to better predict and control your stock, reduce food waste, and of course, positively impact your bottom line.

[WRAP's \(2015c\) stock control and purchasing sheet](#) is a great resource to utilise.



According to [Futouris e.V. \(n.d., p.30\)](#), “Optimising your purchasing procedures is the first step towards preventing spoilage. If you order the right amount of the right types of food then you will have less waste and accrue more cost savings.” The information you gathered during your waste measuring phase can help you identify how much waste is generated in each area of the restaurant. It can help to establish purchasing procedures based on stock control and forecasting.

Forecasting consumer demand is a huge part procurement, though understandably, underestimating the amount of food needed to fill customer demand can be risky and many establishments prefer to err on the side of excess ([Pirani and Arafat, 2016](#)). Predicting the quantity and variety of ingredients required can depend on numerous external factors (restaurants in the area, special occasions, types of guests, etc.); however, there are many different restaurant software solutions to make restaurant management easier ([Mire, 2016](#)).

Here are some tips to optimise procurement and inventory management:

- Order stock through a single primary purchaser. This practice can help to keep records simple and avoid over-ordering
- Communicate with your provider to ensure that the quality/characteristic of the product fits your needs (e.g. the correct sized vegetables, etc.)
- Be sure to avoid over-purchasing by ordering food just before it is to be used/when it is needed. Consult with forecasts before ordering to reflect the expected number of customers
- When buying in bulk, be certain that you will be able to use all of the product
- Set up a “stock and order” form in food storage areas that keeps track of amounts of a particular ingredient as it is used
- Optimise pack sizes to meet the needs of the unit
- Understand the impact of seasonality etc. on the menu
- Ensure packaging is adequate to protect goods
- Review food waste data periodically to ensure measures are effective
- For non-perishables, make sure they have a long shelf life
- Train staff on using items with soonest expiration date first, FIFO (first in first out) and FEFO (first expired first out) principles.
- Train staff on differences between “best by,” “sell by,” “use by,” “freeze by,” “expires on,” on packaging
- Implement strong back of house storage and organisational structures in all kitchens (all kitchens should be aware of where products are – including in other on-site outlets). Have an individual who can be responsible for this
- Provide storage training for staff on optimising space for storage – e.g. use clear stackable containers vs. plastic bags

([WRAP, 2013b](#); [Futouris e.V., n.d.](#); [foodwaste.ie, 2010](#); [NEA and AVA, 2017](#); [HOTREC, 2017](#)).

Familiarity with the menu, inventory, stock shelf life, and reservation cycles (including special occasions) will help in purchasing the right amount of food and prevent wastage upstream.

For more information on responsible purchasing, see UNEP’s [Responsible Food Purchasing: Four steps towards sustainability for the hospitality sector](#) (2015).

Also check out [The Guardian’s list of Top 10 food waste reduction apps from around the world](#).

Solution B: Streamline deliveries

Establishing long-term relationships with your suppliers, staff, and restaurant community is an important step in delivering good products and service quality, as well as minimising risk ([Futouris e.V., n.d.](#)).

Here are some tips to help streamline deliveries:

- Introduce good procedures to report and return spoiled goods
- Check deliveries to ensure that food is free from contaminants
- Temperature check particular foods (e.g. fish) to ensure it has been stored and transported at the right temperature
- Make sure that perishables have a long time before they expire
- Optimise the delivery cycle to minimise food spoilage and associated costs
- Streamline procedures for receiving deliveries (especially chilled) and transferring goods to appropriate storage
- Review food waste data periodically to ensure measures are effective
- Work towards “just in time” delivery rather than pre-ordering in quantity ([WRAP, 2013b](#); [Futouris e.V., n.d.](#); [Pirani and Arafat, 2014](#); [foodwaste.ie.,2010](#))



Solution C: Source locally and seasonally

Sourcing locally and seasonally means that food has less distance to travel and so should be less likely to spoil. Sourcing locally whenever possible not only means a lower carbon impact from transport and refrigeration, it also means fresher and tastier ingredients that are theoretically less likely to go to waste.

Be sure to highlight your locally sourced ingredients and farms for further guest engagement and as a marketing tool. Try to communicate with your guests (and staff) that “imported” doesn’t necessarily mean “better.”

Some restaurants and hotels may even have their own gardens and farms for the freshest ingredients. Talk about hyper local!

In places where land is scarce, [vertical farming](#) and [hydroponic growing systems](#) may also be a solution to ensure sourcing locally grown food.

Further reading:

- [Read about the hydroponic rooftop farm at Anantara Riverside Bangkok Resort](#)
- [Read about the hydroponic system, “The Grow House” at the Ritz-Carlton in Naples, Florida, USA](#)
- [Learn more about vertical farming \(in Thai\)](#)



You may find local suppliers by:

- Connecting with local agricultural or food-related NGOs
- Connecting with other hotels that have a similar goal. You may be able to share successes and failures
- Visiting best practice hotels and learning from them
- Visit local farms and farmers markets
- Working with existing local food cooperatives
- Organising or hosting a local food festival or fair and inviting local farmers to participate

([Futouris e.V., n.d., p.9](#))

Using a seasonal calendar specific to your region can help you identify when products are in season. This is especially helpful in developing seasonally appropriate menus.

See the example below!



Example of a seasonal produce calendar

Case study:

Six Senses Samui has an eco-farm on its property, called “Farm on the Hill,” where it grows its own vegetables and herbs to supply its onsite restaurant. The farm, which used to be landfill, “was born from a landscaping necessity, which includes a large volume of organic waste generated (e.g. branch trimmings), unutilised grey water, and lack of nutrient rich soil.” The farm features a module aquaponic system that is solely constructed from reclaimed waste materials, and a creative waste to wealth garden where food waste is composted. Six Senses Samui now has nutrient rich soil and is able to produce organic eggs, goat milk and an abundant crop of fresh vegetables. Guests, hosts and the local community can enjoy feeding the goats, collecting newly laid eggs, and even picking organic produce for their next meal, giving them a greater appreciation for the food cycle.

([Six Senses Samui, n.d.](#); [PATA, 2017](#))

Solution D: Proper storage and extending shelf life

After figuring out how much food is being thrown out, you can now take action to reduce waste. To maximise the shelf life of the food:

- Handle stock carefully to avoid damage and unnecessary waste. Always send back any damaged goods received from suppliers
- Store food correctly to prevent spoiling (e.g. always make sure the fridge door is shut, make sure refrigerator is below 5°C/freezer is at -18°C)
- Monitor freezer and refrigerator temperatures twice daily
- Understand how certain food items should be stored to extend shelf life, e.g. bananas should not be refrigerated, fruits and vegetables should be stored in wire crates to allow air circulation and reduce microbial growth, lettuce and tomatoes should never be stored close to each other, etc.
- Clearly label products with the purchase and use by dates
- Apply a first-in-first out method of using up stock

- Continually rotate stock by putting the newest product at the back of the shelf so that the oldest gets used first
- Consider vacuum packing, flash freezing, or freezing some items to extend shelf life
- Consider new technologies for extending shelf life such as ozone preservation
- Increase the use of sous vide cooking to increase the shelf life of ingredients
- Revise your shelf/storage plan frequently to ensure it reflects your menu
- Marinate/cook meat and vegetables
- Make ‘scrap’ dishes, such as in-house meat (sausage), vegetable stocks, bread pudding, juices, etc.
- Make low-priced specials around items that are over-stocked or close to expiration

([Futouris e.V., n.d.](#); [Pirani and Arafat, 2014](#); [Pirani and Arafat, 2016](#); [WRAP, n.d.c](#))



Solution E: Menu planning

This is a big one. Menu planning is a key component of preventing food waste and spoilage. Here are a few tips:

Menu design:

- Get customer feedback so you learn what they like and don't like and cut dishes that are unpopular
- Limit the number of dishes (and cuisines) on menus, and try to use the same ingredients to make different dishes throughout the menu.
- Understand the impact of seasonality/weather etc. on menus
- Plan smart menus based on reservation forecasts. Consider the number, demographics (e.g. age) and past food choices of guests
- Develop a seasonal menu to increase variety
- Improve forecasting; match the menu offer to demand

- Assess the costs/benefits of “make” versus “buy”
- Prepare items such as bread, cakes, and desserts in-house so you have control of volumes on a daily basis
- Review food waste data periodically to ensure measures are effective
- Provide KPIs for cost per meal and value of food waste per meal
- Design new menus with food waste reduction and packaging reduction in mind
- Give your customer the right amount of choice. The more items there are on the buffet or menu, the greater the number of ingredients and the higher the potential for waste
- Adapt menus so that items customers often leave are reduced or made optional; pay attention to plate scrapings and dishes that are unpopular
- When adding a new menu item, be sure to do a tasting panel with employees to gain feedback about the potential popularity of the dish
- Ask certain staff members to be “Food Waste Champions” and empower them to report on food waste and make a difference



Recipe management:

- Use a computer-based system for recipe management – software can scale and rescale recipes and their ingredients immediately. If a core recipe is on the computer, the system can produce scaled recipes for each day based on the guest forecasts. Knowing the right amount of ingredients prevents unnecessary food waste by allowing for more efficient purchasing decisions
- Know that the more sophisticated recipes with more ingredients, labour, and time involved may not necessarily be the more popular option. Remember to also consider purchase price and margin as well as the waste it produces
- Understand the skills and equipment available and match them to recipes
- Use core items across the menu. A good example is tomatoes, which can be roasted, made into soups, used in salads and as a garnish. Consider what other items you can use in a similar way ([WRAP, n.d.](#))
- Create menus that use fewer ingredients to reduce the risk of any going out of date ([WRAP, n.d.a](#))
- Remember that more complication generates more waste. Careful menu planning may prevent waste in many ways

Ingredient planning:

- Plan menus to use food approaching its expiration date. A good way to do this is to offer specials or a “dish of the day”
- Revise menus to serve less wasteful dishes. For example, Pirani and Arafat, note that cheap carbohydrates are on the top of the food waste heap ([Pirani and Arafat, 2016](#)).
- Again, keep the range of ingredients down, or use perishable items in more than one menu option so they are used faster resulting in greater stock turnover.
- Buy small quantities of short-shelf-life items, or use ingredients with a longer shelf life.
- Review menus to minimise range and ingredient mix
- Reduce the number of ingredients per menu

Further reading:

- [Futouris e.V. \(n.d.\)](#) also notes that smart menu planning is the key to waste prevention. See the Futouris [Sustainable Food Manual](#), page 21, for more ideas on food preparation and designing a sustainable menu.”
- Unilever Food Solutions (n.d.) has also developed the “Wise up on Waste Toolkit,” which can help plan menus while keeping track of costs. [Download here](#).
- For more resources and some recipe ideas, check out [Love Food Hate Waste](#).
- For more information on healthy, sustainable menus, visit [menusofchange.org](#)

CHALLENGE: PREPARATION WASTE

When preparing food, there will inevitably be trimmings from preparation that cannot be used in other ways. It is understandable that some fruits and vegetable skins and seeds will need to be discarded, and that bones and offal from meat won't be on the menu. There can be ways to reuse food that would otherwise be prep waste, and ways to minimise what goes directly in the bin.

Solution: Managing food prep

As you know, everything in the kitchen is connected; as [Pirani and Arafat \(2016, p.136\)](#) note, “preparation waste generated depends on the types of dishes prepared. For example, there tends to be more preparation waste from fresh and raw ingredients and so, for example, dishes which are vegetable-based may be expected to generate more preparation waste than pasta-based dishes... Breakfast buffets tend to serve foods such as cereals and jams which have a longer shelf life and so do not lead to food waste generation if not consumed at the first event where they are served.”

Here are some tips to manage food waste in the prep area:

- Provide training to ensure the kitchen team has the appropriate skills
- Avoid over trimming during preparation
- Use the right equipment to maximise food (e.g. calibrate oven to prevent over cooking, use peelers that produce lighter peels)
- Consider leaving the skins on vegetables
- Implement effective processes to reuse excess supply (e.g. daily specials)
- Cook smaller quantities of pre-prepared staple foods (e.g. rice, pasta) in smaller batches
- Utilise bones from meat and vegetable trimmings to make stock
- Utilise animal fats for grease
- Get creative with your garnishes by using what would have been prep waste
- Ensure good communications with your (e.g. events) team to match food availability to customer numbers
- Ensure good communications with your service team to report on complaints/popular dishes/customer flow
- Review food waste data periodically to ensure measures are effective

([WRAP, 2013b](#); [Pirani and Arafat, 2014](#); [foodwaste.ie, 2010](#); [HOTREC, 2017](#))



CHALLENGE: OVERPRODUCTION



Making too little food is always an embarrassment; overproduction is much less risky. Measuring and managing the amount of food that is uneaten can help to save on costs that will make a sizeable impact on your bottom line.

Solution A: Considering types of service

A la carte style service will generate less waste than buffet style service in terms of overproduction, and in terms of plate waste.

Buffets will almost always produce more food waste in the area of overproduction; again, it would be a risk for kitchens to produce less. In the event that there is not enough food, kitchens scramble last minute to make more, often generating more waste as a result.

Different styles of buffet can also impact the amount of waste generated at mealtime:

- Family style
- Semi-buffet
- Sit-down buffet
- All you can eat
- Single pass



For example, as noted by [Pirani and Arafat \(2016, p.132\)](#), the “Abu Dhabi government have also taken notice of the issue of food waste in the hospitality sector and have accordingly suggested that light refreshments be served at weddings (in lieu of lavish dinner buffets) in an effort to reduce food waste. Consequently, some hotels have started offering *hor d’oeuvre* menus as an option for their clients. Such menus generate much less food waste than a full course lunch/dinner due to the petite nature of the menu items served and their more dynamic supply-upon-demand nature.”

Customers will always have their expectations, but communicating with the guest about the types of dining service offered and why they are offered can help to manage those expectations.

Solution B: Managing a buffet

When putting on a buffet, perhaps for a large banquet or catering for an event, it can often be expected that there will be more waste than during à la carte service. Here are some ways to minimise waste:



- Review food service choices (e.g. various types of buffets)
- Consider smaller/variety of plate sizes
- Prominently display buffet messages to minimise waste (some restaurants even implement a fine for guests who take too much and don't finish their plates)
- Provide feedback forms for guests
- Avoid displaying too much all at once; top up as demand dictates
- Closely monitor the amount of food that is put out
- Do not re-fill the buffet in the last quarter of service
- Use different types of containers that allow you to adjust the amount of food presented
- Pre-apportion smaller or bite sized portions rather than placing all the food in one large container
- Save data pertaining to repeat groups (MICE in particular) for their return visit in order to appropriately menu plan their next buffet.
- Use live cooking (e.g. egg stations or roast beef bar) to control portion size but also minimise the amount of food cooked/touched by the guest
- Use smaller food containers towards the end of the buffet
- Review food waste data periodically to ensure measures are effective
- Have a backup plan for food rescue, reuse, or redistribution (e.g. [Scholars of Sustenance Thailand \(Thai-SOS\)](#) ad-hoc food pickup program)

([WRAP, 2013b](#); [Futouris e.V., n.d.](#); [HOTREC, 2017](#))

CHALLENGE: PLATE SCRAPINGS



Plate scrapings are the uneaten food that is left on a guest's plate. Typically, it is no longer fit to “reuse” or “recycle,” but can be recovered or diverted from landfill in another way, as compost or as use for biofuel. Food service establishments can also invest in an aerobic food digester such as the [ORCA](#), a machine that turns food waste into environmentally safe water that can be released into the municipal sewage system. [Cowtech](#), a technology developed in Thailand, turns waste into another form of usable energy. Because plate scrapings occur rather far down on the food waste hierarchy, it is good to try to avoid as much of it as possible. Besides doggy-bagging, here are some ways to reduce the amount of plate scraping waste that is generated at your eatery.

Solution A: Portion control



- Minimise the quantity of bread and starter portions provided prior to the meal
- Serve condiments in small portions
- Serve smaller, carefully weighed out portions
- Offer different portion sizes to your clients to fit various needs, e.g. S/M/L, “smaller appetites,” or kids portions
- Make the choice of side dishes more flexible, or optional (for reduced price), e.g. smaller portion sizes with refill options
- Favour flavour over quantity

([Pirani and Arafat, 2014](#); [Futouris e.V., n.d.](#); [WRAP \(2013b\)](#); [HOTREC, 2017](#))

Solution B: Service and presentation

According to [Futouris e.V. \(n.d., p.22\)](#), “a thought-through way of presenting your menu also helps to reduce waste and leftovers and subsequently reduce your costs.” Here are some ways to make the most of service and plate presentation opportunities:

- Serve food on smaller plates to make the portions look larger
- Present food in an attractive way using colourful and fresh-looking ingredients with various textures
- Present food creatively, reducing the quantity served
- If using garnishes for decoration, try to utilise the inedible part of the fruit or vegetable from kitchen prep
- Offer as much front/show cooking as possible, allowing you to prepare fresh, correctly portioned dishes in front of your guests, and to their liking
- Use more voluminous garnishes such as curly salad leaf; they create the same volume on the plate but use fewer leaves

([Pirani and Arafat, 2014](#); [Futouris e.V., n.d.](#))

Solution C: Communicating with guests



Communication is key. It is vital to communicate any changes to your practices as well as your sustainability policy and food waste reduction efforts to your guests. As [Futouris e.V. \(n.d., p.24\)](#) notes, “research has shown, many change processes [...] do not work because of a lack of communication. In addition, communication helps to develop a positive image of the business for stakeholders and, especially among guests.” **Behaviour change starts now!**

Case study:

In 2014, the Intercontinental Doha – The City Hotel began a campaign to cut food waste, by raising awareness. It utilised signboards and presentations, and educated both its staff and its guests. Signs include the one seen at the buffet ([Windrum, 2014](#)).

“Raising general awareness about food waste and its costs automatically drives waste down” ([Futouris e.V., n.d., p.30](#)).

A [Unilever \(2011\) report](#) found that in China, 93% of people (survey respondents) agreed that there should be more visibility about the sustainability practices of restaurants.

When it comes to communicating with guests, be sure to train your staff on the topic so that they can help to raise awareness, and answer questions guests and other stakeholders might have. A good communication policy and strategy will help “to build trust between you and your clients and [will] create value and brand identity: once your clients have realized that they will receive certain information, they appreciate it” ([Futouris e.V., n.d., p.22](#)).

Some questions you may ask your guest when taking orders:

- Portion size (half, full, kids)
- Ingredients or allergies
- Preferred cooking methods
- Sides (with or without, types of sides available)

Train staff to read back the order to guests. This type of communication takes the customer’s preference into consideration and reduces the amount of plate waste, or the frequency of plates being sent back.

Provide guests with additional information about your sustainability and food waste practices on your menu and on signage throughout your restaurant — Futouris provides great tips on page 25 of their *Sustainable Food Manual*. ([Futouris e.V., n.d., p. 25](#))

Target social norms that lead to food wastage. For example, doggy bags in Thailand and the UK are not looked upon favourably; therefore in many UK restaurants, servers are now instructed to take it upon themselves to provide a doggy bag if there is a lot of food left on a guest’s plate ([Pirani and Arafat, 2014](#)).

Managing expectations can be much easier if communication is frequent and open. This practice also extends to encouraging guests to make and keep to reservations, (or be charged for a no-show; guests must provide their credit card information when making a reservation), and reply to invitations in the case of events, so that a more accurate headcount can be accomplished and preparations including purchasing can be done accordingly.

[WRAP \(n.d.e\)](#) research on out of home eating in hotels and other sites can be found here, including a [resource pack on engaging with consumers to help reduce plate waste](#) to help sites take action ([WRAP, n.d.f](#)).

Remember that communication goes both ways; ask whether the customer actually wants that refill, condiment, or side dish, rather than serving it automatically.

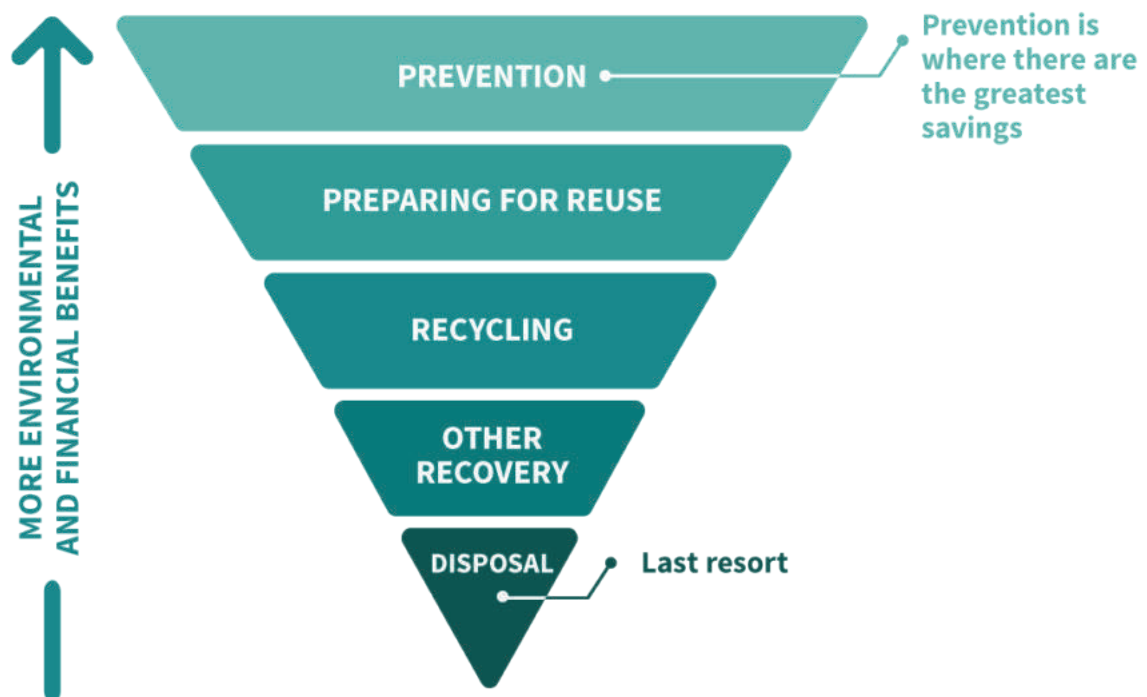
As with all solutions you choose to implement, be sure to review food waste data periodically to ensure measures are effective.

CHALLENGE: WHAT TO DO WITH WASTE

There are generally two kinds of food waste – edible and inedible. Edible food waste is fit for human consumption. Inedible food waste is not fit for human consumption; however, it may still be useable for animal consumption or for creating compost.

Solution A: Rescue, reuse and redistribution

According to the food waste management hierarchy, although the most preferable option would be to reduce waste, sometimes food waste is inevitable. Source reduction, followed by food donation are the most preferable, as it is the most beneficial for society and environment. Energy recovery – feeding animals, followed by composting and anaerobic digestion or less preferable, but better than landfill or incineration, which are the least preferable options.





Distributing food donations to those in need

In the food waste management hierarchy, preventing and reusing excess food, followed by donating food, followed by composting/energy recovery, are the options presented in reuse and redistribution.

As such, there are many different ways to handle food waste; how you do it will depend on the infrastructure available both within your organisation and its property, and your municipality.

Having a reliable partner for donations can make all the difference. Here is a list of organisations across the globe that help redistribute quality excess food, as well as inedible food waste.

VIEW LIST OF FOOD REDISTRIBUTION ORGANISATIONS WORLDWIDE

Edible vs. Inedible Food Waste

Edible:

- Use leftovers to make something else (e.g. bread pudding out of breakfast toast)
- Develop a staff programme
- Engage local organisations/institutions such as churches, prisons, shelters, etc. that may have a need for quality excess food
- Find a community fridge programme
- Give to a local “[Buy Nothing](#)” group

Inedible:

- Invest in a food waste digester
- Develop a compost on site (and use compost as fertiliser on hotel grounds, gardens, etc.) ([Case study: Four Seasons Hotel, Philadelphia](#))
- Take compost to local farm
- Arrange pickup with your municipality for organic waste



One important aspect to remember when redistributing food via charity donation is that hotels must perform due diligence and make sure that charity recipients sign a waiver to protect the hotel from any liabilities. [Thai-SOS has a sample of a contract, [downloadable here](#).] It is therefore imperative to abide by all food hygiene best practice and food safety regulations at all stages of the food management process: delivery, storage, preparation, service, and redistribution.

Case study:

Grupo Vidanta in Riviera Maya, Mexico is dedicated to reducing waste to landfill – it has reduced its waste to landfill to 0.6L per guest night, 78.9% better than best practice. Through this, Grupo Vidanta has been able to direct nearly 274,000lbs (as of 2010) of fruits and vegetables from landfill. Grupo Vidanta transfers kitchen waste to its vermicomposting beds, which generate a fertiliser and topsoil used in its nurseries. Meat waste from the kitchen is used for animal feed, produced via a recycler, which is able to recycle over 8,000lbs of meat in six months. Oil from kitchens is also recovered and delivered to recyclers for processing and for reuse as soap, cleaning products, and animal feed. ([EarthCheck, n.d.](#))

Solution B: Contact lawmakers

If avoiding landfill is simply impossible, we urge you to contact your local politicians and lawmakers to consider putting some infrastructure in place, or to consider exploring possible areas of cooperation. Take it from these examples:

- The Hong Kong government has developed a [Food & Yard Waste Plan for 2014-2022](#). The plan sees the need to change habits to be more sustainable and sets a goal for 2022 to reduce food waste to landfills from 3,600 tonnes/day to around 2,160 tonnes/day (a reduction of about 500,000 tonnes/year) over the course of 8 years.
- In Italy, [Senate has passed a bill offering incentives to businesses that donate excess food and also funds programmes to tackle food waste in hospitals and schools](#).
- In France supermarkets must [give unsold food to charities](#).
- In Abu Dhabi, a tariff system charges certain sectors (construction, commercial, industrial, includes hospitality) per ton of waste generated. The top 5% of waste producers must also provide an audit report. ([Pirani and Arafat, 2016](#))
- In Australia, OzHarvest has worked to make sure that food donations are covered in Good Samaritan Laws



Johns Hopkins University's Bloomberg School of Public Health recently published "[Governmental Plans to Address Waste of Food](#)," which reviews governmental plans to address food waste around the world with a focus on the US.

According to [Unilever's \(n.d.\) study](#), "Internationally, people feel that it is the responsibility of the government to ensure transparency around the sustainable practices employed by dining establishments... Consumers also expressed a belief that it is the responsibility of the government to ensure sustainable practices in restaurants."

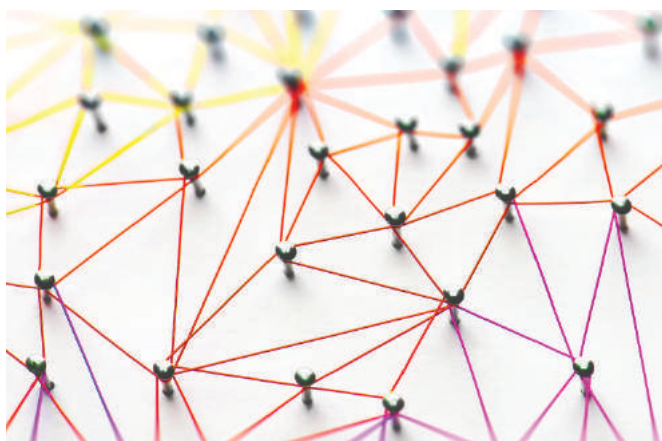
[VIEW LIST OF WORLDWIDE LEGISLATIONS](#)

"Though sustainable practices are becoming more and more popular, changes in policy and regulation, followed by proper enforcement and monitoring, are still seen as the most effective ways to bring about measurable change throughout an entire country. As an example, restaurateurs in Japan have urge the state to be more proactive if they would like to see the restaurants implement eco-friendly practices in a more effective manner."
([Pirani and Arafat, 2014, p.323](#)).

"[Prevention and reduction of food waste in businesses and households](#)" is a fantastic resource and model for governments to develop food waste reduction programmes from UN Environment (UNEP, 2014).

Contact [Scholars of Sustenance Thailand \(Thai-SOS\)](#) for more information about how you can contact your local lawmakers.

Solution C: Establish networks



[Futouris e.V. \(n.d., p.10\)](#) says:

"Many hotels are aware of the importance of local food. Nevertheless, it is sometimes not easy to buy local food due to a lack of logistics, infrastructure and communication. In addition, some providers and local producers are simply too small."

Therefore, the development of local networks is of vital importance. Strong networks with local suppliers and producers helps to overcome certain obstacles on the way towards a more sustainable food policy and practice. The building of such networks is a critical and long-term process.”

Futouris gives three easy steps to follow when building regional networks on page 10 of their [Sustainable Food Manual](#).

Remember: You never can reach everything at the same time. Try to build your networks stepwise.

Solution D: Disposal

If disposal is absolutely necessary, be sure to abide by all local food disposal standards.

In particular, be conscious of your fat, oil, and grease disposal. For more information on reducing the quantity of fat, oil, and grease, as well as information about the hidden costs of grease, check out [foodwaste.ie. \(2010\) page 28-29](#).

Conclusion

There is no magic ingredient to reducing food waste to landfill; the recipe to success is to be sure to measure your waste, and to plan your ingredients carefully. Below, you will find a checklist that can aid in your journey to successful food waste management. We hope that this toolkit has been a valuable resource for you. Bon appetit!

[VIEW FOOD WASTE MANAGEMENT CHECKLIST](#)

REFERENCES

[Buzby, J., Hyman, J. \(2012\)](#): Total and per capita value of food loss in the United States. Food Policy. 37 (2012): 561–570.

[EarthCheck \(2012\)](#): Company standard. Version 3.5 June 2012.

[FAO \(2011\)](#): Global food losses and food waste – Extent, causes and prevention

[FAO \(2013\)](#): Food wastage footprint. Impacts on natural resources. Summary Report

[Foodwaste.ie \(2010\)](#): Less Food Waste. More Profit. A Guide to Minimising Food Waste in the Catering Sector

[Futouris e.V. \(n.d.\)](#): Sustainable Food Manual

[Green Hotelier \(ITP\) \(2013\)](#): Increasing employee engagement in recycling

[Green Hotelier \(ITP\) \(2014\)](#): Reducing and Managing Food Waste in Hotels

[Hanson, C., Mitchell, P. \(2017\)](#): A report on behalf of Champions 12.3: The business case for reducing food loss and waste

[HOTREC \(2017\)](#): European hospitality industry guidelines to reduce food waste and recommendations to manage food donations

[Mire \(2016\)](#): 100 Amazing Restaurant Software Apps You Need To Know

[NEA and AVA \(2017\)](#): Food Waste Minimisation Guidebook for food retail establishments

[PATA \(2017\)](#): Talking food waste with Six Senses: Sustainable luxury hotels and resorts

[Pirani, S., Arafat, H. \(2014\)](#): Solid waste management in the hospitality industry: A review. Journal of Environmental Management.146 (2014): 320-336

[Pirani, S., Arafat, H. \(2016\)](#): Reduction of food waste generation in the hospitality industry. Journal of Cleaner Production. 132 (2016): 129-145

[Six Senses Samui \(n.d.\)](#): Farm on the Hill

[The Guardian \(2017\)](#): Tackling food waste around the world: our top 10 apps

[The Travel Foundation \(2013\)](#): Waste Mapping Guidance for Hotels in Cyprus: Saving money and improving the environment

[UN Environment \(2017\)](#): Mottainai Waste Facts & Figures

[UNEP \(2014\)](#): Prevention and reduction of food and drink waste in businesses and household. Guidance for governments, local authorities, businesses and other organisations. Version 1.0

[Unilever Food Solutions \(2011\)](#): World Menu Report Global Research Findings 2011

[Unilever Food Solutions \(n.d.\)](#): Managing Food Waste. 'Wise Up On Waste' Toolkit

[US EPA \(2015\)](#): Waste Logbook

[Windrum, E. \(2014\)](#): Intercon cuts food waste among employees with new campaign

[Winnow Solutions \(n.d.\)](#): Sofitel Bangkok Sukhumvit saved +\$60,000 by reducing food waste

[WRAP \(2013a\)](#): Estimates of waste in the food and drink supply chain

[WRAP \(2013b\)](#): Overview of Waste in the UK Hospitality and Food Service Sector

[WRAP \(2013c\)](#): The True Cost of Food Waste within Hospitality and Food Service

[WRAP \(2015a\)](#): Food Waste Tracking Sheet

[WRAP \(2015b\)](#): Quantification of food surplus, waste and related materials in the supply chain

[WRAP \(2015c\)](#): Stock control & purchasing list template

[WRAP \(2017\)](#): Your Business is Food

[WRAP \(n.d.a\)](#): Menu planning for preventing food waste

[WRAP \(n.d.b\)](#): Food waste in hospitality and food service sector

[WRAP \(n.d.c\)](#): Hospitality and Food Service - getting started on waste prevention. Simple ideas to cut waste costs

[WRAP \(n.d.d\)](#): Hotels: Taking Action on Waste

[WRAP \(n.d.e\)](#): Less food saves money

[WRAP \(n.d.f\)](#): Resource pack for Hospitality and Food service sector. Engaging with consumers to help reduce plate waste

[WRAP \(n.d.g\)](#): Your Business is Food; don't throw it away!

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