



The Toolkit

Household food waste reduction toolkit:
A step-by-step guide to delivering
interventions in Australia

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Executive summary

This toolkit provides research-based guidance to organisations and individuals focused on developing strategies and implementing interventions to reduce household food waste in Australia. The toolkit identifies issues to be considered and suggests steps required to implement impactful household food waste reduction interventions. It is organised into three sections: planning, implementation, and evaluation and feedback. This executive summary presents key considerations under each of those steps.

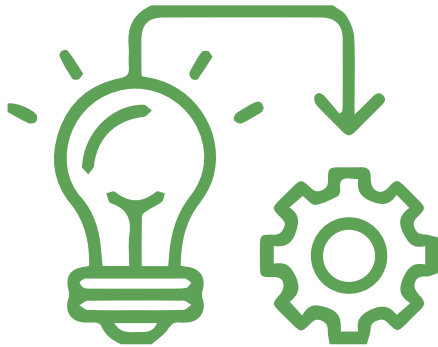


Stage 1

Planning

Setting out a solid plan ensures the best chance of success

- ✓ **Objectives:** What are the objectives of the intervention?
- ✓ **Audience and behaviours:** Who is the target audience and what action do you want the audience to perform?
- ✓ **Resources:** What are the resources available to plan, implement and evaluate the intervention?
- ✓ **Communication plan:**
 - > What message frames will resonate well with the target audience?
 - > How to simplify and amplify the message
 - > What communication methods will be used to reach the target audience?
 - > Who are the stakeholders / delivery partners and how to get all partners and channels to deliver messages consistently?
- ✓ **Activities:** What is the most impactful and relevant intervention?
- ✓ **Ethics and other approvals required.**
- ✓ **Timing:** What is the duration of, and the best time to implement, the intervention?
- ✓ **Evaluation:** What indicators will be used to evaluate the impact of the intervention?



Stage 2

Implementation

Good implementation means testing and adjusting along the way

- Develop and test data collection tools
- Obtain baseline data about current food provisioning behaviours in target audience
- Develop and test communication content
- Communicate using methods that can best reach your target audience
- Implement the intervention
- Continue to monitor engagement in target audience
- Make adjustments based on feedback from monitoring, such as reminders to individuals in target audience who lack engagement



Stage 3

Evaluation and feedback

Make sure you plan to evaluate your intervention - so you can learn what worked and what can be improved next time

- Evaluation will focus on objective of intervention. Such as change in:
 - > specific food provisioning behaviour(s) or
 - > amount of waste for a specific food product or
 - > total amount of food waste from the household or
 - > level of awareness in the household after the intervention
- Evaluation can be done using surveys, electronic diaries, bin audits, interviews, focus groups or observations
- Consider advantages, disadvantages and assumptions when choosing the evaluation approach and interpreting data gathered from it
- To estimate the actual amount of food wasted use the following adjustment factors to get more accurate results: : Surveys x 1.7, Electronic diaries x 1.2, Bin audits x 1.9
- Share the results where you can because it allows others to improve the impact of their interventions



1 Introduction

1.1. Purpose of the Toolkit

This toolkit provides research-based guidance to organisations focused on developing strategies and implementing interventions to reduce household food waste in Australia. It identifies issues to be considered and suggests steps required to implement impactful interventions. The toolkit focuses only on household food waste avoidance and food waste diversion further up the supply chain.

1.2. Audiences for the Toolkit

This Toolkit is designed to be used by those seeking to help individuals in households reduce their food waste including:

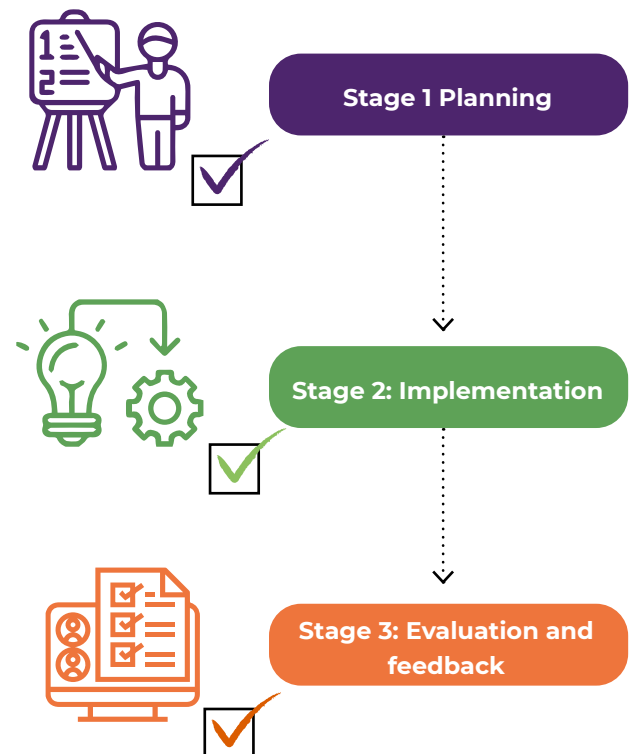
- > Organisations sponsoring interventions such as supermarkets, food service businesses, food manufacturers with consumer facing brands, governments (federal, state and local), charities and community groups
- > Government delivering programs/communications
- > Policy makers (e.g. federal, state, territory and local governments)
- > Individuals responsible for program and communication delivery
- > Researchers who are contributing to understanding of food provisioning behaviours in households and how to create more impactful food waste reduction interventions

1.3. The Fight Food Waste Cooperative Research Centre (CRC)

The Fight Food Waste CRC was established in 2018 to support the Australian Government in its efforts to halve food waste by 2030, as outlined in the National Food Waste Strategy. Additional information and reports on how to best reduce household food waste are available on the Fight Food Waste CRC website.

1.4. Step by step guide

This toolkit discusses 3 important stages in designing and implementing an intervention.

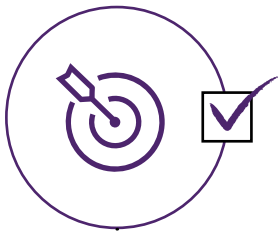


2

Stage 1: Planning

2.1 Summary of Stage 1: Planning

The following areas should be considered during the Planning Stage:

**Objectives:**

What are the objectives of the intervention?

Primary goal: Reducing the amount of household food waste

Objectives within this primary goal can then be narrowed down further, depending on the behavioural focus and interventions chosen.

Reducing household food waste can be achieved by focusing interventions on:

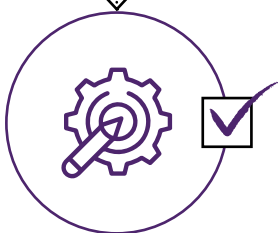
- > Changing behaviours in ways that support reducing amount of food waste
- > Reducing the amount of household food waste of a food category
- > Reducing the amount of household food waste of a specific food product
- > Increasing awareness of food waste in the household

**Audience and behaviours:**

Who is the target audience? e.g. Mass market or focused on a specific segment (such as households who are 'over providers' or 'under planners')

What action do you want your audience to perform?

- > Use the 'audience, target, action, context, time' (ATACT) framework to define the behaviour.
- > e.g. Food manager (audience) in households (context) creates a weekly meal plan (action) before going to the shops (time) in order to reduce food waste (target) in their homes

**Resources:**

What are the resources available to plan, implement and evaluate the intervention?

- > e.g. Budget, people (including capabilities, skills, networks), channels



Communication plan:

- > What message frames will resonate well with the target audience?
- > e.g. Saving money, avoiding loss of food, saving scarce resources used to produce food
- > Simplify and amplify the chosen message
- > What communication methods will be used to reach the target audience
- > Identifying stakeholders / delivery partners and ensuring all partners and channels deliver messages consistently



Activities for your program:

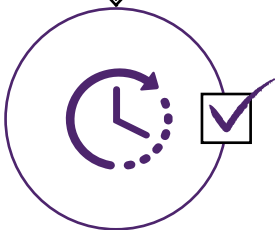
Based on your objectives, audience and resources, what is the most impactful and relevant intervention for you to focus on?

- > e.g. Information intervention, changes to packaging on specific food products



Ethics and other approvals required:

Depending on the organisation responsible for the intervention, it is necessary to check the approvals required, including from any relevant boards or committees. It is important to allocate sufficient time to complete this administrative step.



Timing:

What is the duration of, and the best time to implement, the intervention?

- > Make a detailed schedule including time to plan, obtain approvals, recruit participants etc
- > Be aware of potential influence of special events (e.g. Christmas, Easter, school holidays) or seasonal issues (e.g. for specific fruits and vegetables) on any evaluation.



Evaluation:

What are the indicators required to evaluate the impact of the intervention?

- > e.g. Number of households reached, reduction of food waste in household, change in specific behaviour.

2.1. Set objectives for the intervention

Reduction in total household food waste generated is the end goal of all interventions. However, there are multiple intermediary objectives to focus on whilst in pursuit of reaching this end goal.

These intermediary objectives can be: changing behaviours leading to total household food waste, reducing amount of a product category or specific products that is wasted.

It is important to be clear about the objectives to be achieved and to ensure that everyone involved is aware of it. This sets a clear goal for different individuals and organisations contributing to the intervention (e.g. managers, funders, researchers, evaluators, behaviour change experts, marketing).

Answering the following questions can help identify the objective of the intervention:

- Will the intervention consider decreasing the amount of *avoidable* (e.g. leftovers, bread) food waste?
- Will the intervention consider decreasing the amount of possibly avoidable (e.g. broccoli stalks, outer leaves) food waste as well? (If yes, then include decreased amount of all avoidable, possibly avoidable, and unavoidable)
- Will the intervention focus on a particular behaviour (e.g. planning, shopping, storing, preparing, or disposing)?
- Will the intervention focus on a specific product (e.g. bread, milk) or product category (e.g. bakery, vegetables, meat)?
- Will the intervention focus on a specific consumer segment (such as 'over providers', 'under planners' or 'considerate planners' Karunasena et al., 2021a)?

2.1.1. Priority behaviours for developing interventions

If the objective is to encourage households to adopt behaviours that lead to a reduction in food waste, evidence recommends focusing on one or more of the following behavioural groups (Ananda et al., 2021b).



Figure 1: Priority behaviours for reducing household food waste

Focus can be further refined even within these priority behaviours – by outlining and specifying who would be undertaking the behaviour, where it is occurring, what is involved in it and when. A simple acronym – ATACT – can be used to step through this thinking (Bragge et al.).

Audience – who is having to do the behaviour?

Target and Action – what are they doing, and does it involve particular objects (e.g. writing a list)?

Context – where is it occurring?

Time – when do they do it?

Outlining each of these is helpful because barriers to the behaviours will differ depending on each of these factors.

2.1.2. Priority categories for developing interventions

If the objective of the intervention is to focus on reducing the amount of most wasted food categories, then evidence recommends focusing on one or more of the following categories (Ananda et al., 2021b).

Food categories to be prioritised (top 5 out of 13 based on \$ value)



Figure 2: Priority product categories for reducing household food waste



When developing interventions to reduce food waste in a food category, it is important to identify the most wasted products within that category. You could choose to define this by either weight or dollar value. Then focus on the consumer behaviours causing those products to be wasted.

For example, focusing your interventions on cooked beef or chicken would be a good target - as both products sit within the most wasted products by

value and by weight. Then you could look at what behaviours are contributing most to those items being wasted.

Tables 1 and 2 below show the most wasted products in terms of its contribution to value (\$) of food waste and weight (kg) of food waste.

Table 1: Most wasted products by value (\$)

Category	% (of total \$ food waste)	Products (Top 15 out of 745)		
Meat and seafood	21	Beef (Cooked)	Ham	Chicken (Cooked)
Fresh vegetables/fresh herbs	19	Salads	Tomatoes	
Meals	11	Pasta (Cooked)	Rice (Cooked)	Potatoes (Cooked)
Bread, bakery, confectionery and snacks	8	Bread Rolls	Slice Bread	
Fresh fruit	6	Bananas	Apples	
Dairy	3	Cheese	Yogurt	Milk

Table 2: Most wasted products by weight (kg)

Category	% (of total \$ food waste)	Products (Top 15 out of 745)		
Fresh vegetables/fresh herbs	11	Tomatoes	Salads	
Meat and seafood	9	Chicken (cooked)	Beef (cooked)	Ham
Bread, bakery, confectionery and snacks	9	Sliced bread	Bread rolls	
Meals	7	Rice (cooked)	Pasta (cooked)	Potatoes (cooked)
Fresh fruit	6	Bananas	Apples	
Dairy	6	Milk	Yogurt	Cheese

2.1.3. Priority products for developing interventions

If you choose to focus on reducing the specific food products most wasted, then evidence recommends focusing on or more of the following (Ananda et al., 2021b).

Products to be prioritised (top 15 out of 745 based on \$ value)

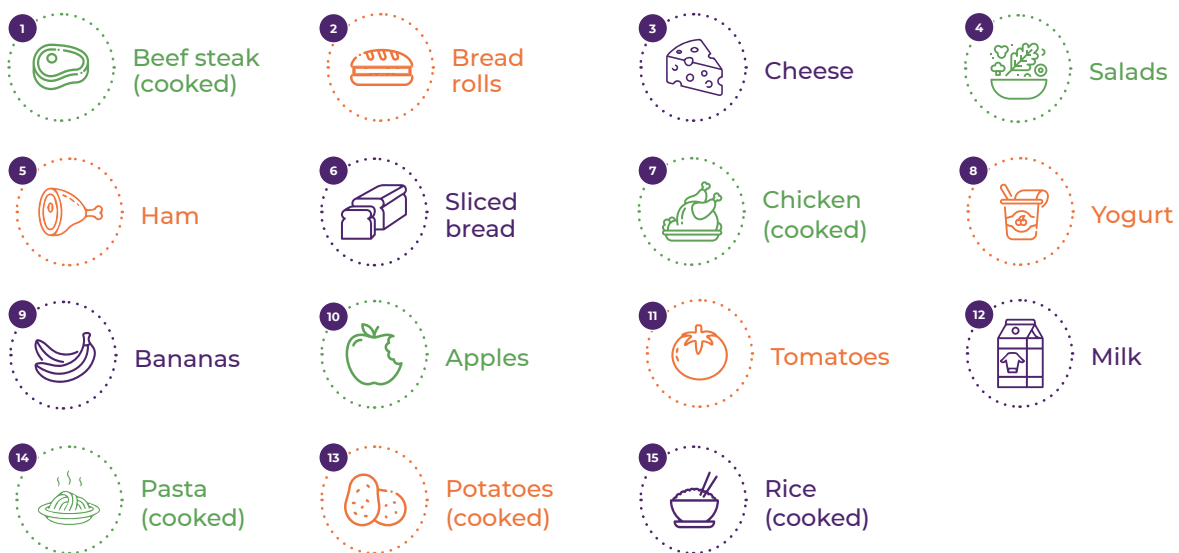


Figure 3: Priority products (by value \$) for reducing household food waste



2.2. Target audience

It is important to decide whether the focus of the intervention will be mass market or a specific segment.

A mass marketing intervention can be used to create awareness of food waste through highlighting issues such as the impact it has on the natural environment and squandering of limited resources. There can be limitations to this as messages can sometimes become too generic

and audiences can tune out or not perceive it as relevant to their context. Having a more specific audience can help address key barriers to those behaviours and their lifestyle and context. If a decision is made to take a segmented approach, it is important to understand the target audience. Three profiles were developed by the FFWCRC based on research insights: Over providers, under planners, and considerate planners are a useful way to segment a broader audience (Karunasena et al., 2021).

Households to target



	Over providers	Under planners	Considerate planners
Who	<ul style="list-style-type: none"> > Mostly young couples (below 45 years), with young children living at home 	<ul style="list-style-type: none"> > Mostly middle aged (35 – 64 years) single or couple, no young children living at home 	<ul style="list-style-type: none"> > Mostly older couples (55 years or more), no young children living at home
Context	<ul style="list-style-type: none"> > Managing busy schedules (often with both working), and multiple food preferences > Often eat out 	<ul style="list-style-type: none"> > Lack of interest in food provisioning > The least likely to plan food shopping and cooking 	<ul style="list-style-type: none"> > Generally current behaviours support reducing food waste
Attitude to changing behaviours	<ul style="list-style-type: none"> > Moderately motivated > Feels it requires effort 	<ul style="list-style-type: none"> > Least motivated > Feel not much effort required 	<ul style="list-style-type: none"> > Most motivated > Feel not much effort required
Behaviours to encourage	<ul style="list-style-type: none"> > Keep some flexibility when planning meals > Purchase right amount of food > Prepare right amount of food > Eat leftovers 	<ul style="list-style-type: none"> > Purchase right amount of food > Prepare right amount of food 	<ul style="list-style-type: none"> > Provide support for continuation of current behaviours > Encourage them to become mentors for Over providers and Under planners

Figure 4: Target audience segments for reducing household food waste

Over providers and under planners are the two segments who waste the most amount of food. As such, focusing on helping these two segments overcome their weaknesses would bring about the highest impact in terms of reducing amount of food waste.

After deciding on which segment(s) to focus on, the next step is to develop a detailed understanding of those segments. This can be achieved by finding answers to the following questions:

a) Who is the target segment for the intervention?

- e.g. Will it be over providers, under planners or considerate planners?

b) What attitude/s does the target segment have towards food provisioning and food waste?

- e.g. Positive or negative emotions towards food provisioning and food waste, level of motivation to change, perceived effort to change their behaviours

c) What behaviours are leading to food waste in their homes for this segment?

- e.g. purchasing too much, cooking too much, lack of planning

d) What products/ categories do they waste the most?

- e.g. Meat and seafood, vegetables and herbs, bakery products

e) What contextual factors (and to what degree) affect the target's ability to effectively manage food provisioning and take action to reduce food waste?

- e.g. busy life style, eating habits of their children, unpredictable schedules of family members, lack of skills

f) What incentives might increase their engagement with the intervention?

- Provision of tools to support the intended action e.g. bag clips, storage containers, kitchen caddies, weigh scales, fridge stickers
- Incentives to get consumers engage with the evaluation e.g. serving food, vouchers, food platters

g) What methods are most suited to reach the target audience?

- e.g. Facebook, Instagram, Snapchat, TikTok, other social media, community centers, community events, market places, television, radio, print media, schools, universities, work places

2.3. Assess Resource Availability

It is very important to assess resources available before moving to the next step of deciding the activity. Consideration needs to be given to what

resources are available to plan, implement and evaluate the intervention. Table 3 summarises some of the resources needed when designing an intervention.

Table 3: Resources required to develop, implement, and evaluate an intervention

Resource	Examples of resources required at each stage of the intervention		
	Planning	Implementation	Evaluation
Financial	Budget to match the cost of designing and delivering the intervention	Budget to deliver the range of activities supporting the intervention – creating resources, distribution, events, communications, designing and producing tools, training. Where relevant, budget to incentivise participation of target audience in the intervention and for completing pre and post intervention evaluations	Budget for data analysis, monitoring and reporting
Human	<p>Food waste experts, including behaviour change experts, to design the intervention including development of content.</p> <p>Marketing and engagement experts to develop the communication and engagement strategy.</p> <p>Research experts to design data gathering instruments and evaluation methods.</p> <p>Partners who can assist in delivering – industry, community, business, etc.</p>	<p>Project manager and delivery team (dependent on the nature of the intervention, program and delivery activities).</p> <p>Contractors (where not delivered in-house).</p>	Data analysis and reporting
Infrastructure		<p>Access to and budget for data gathering platform (e.g. for hosting survey).</p> <p>Access to and budget for social media platforms.</p>	

2.4. Select most impactful and relevant intervention

When the objective, target audience and resources are clear, the next step is to decide what type of activities are best suited for the intervention. Partnering with other influential individuals, organisations, and community groups to spread the message will not only increase the reach but also be a cost-effective way of increasing impact from the intervention. When selecting these partners try to choose organisations and individuals who are resourceful and popular enough to reach audiences your organisation is unable to reach on its own.

Some interventions will focus on engaging people to do something different. This could be via one or more of the following:

- > **Provision of information** e.g. on the impacts of food waste
- > **Prompting people to undertake a 'desired' behaviour** e.g. providing reminders at the appropriate time for storing leftovers
- > **Modelling behaviour** i.e. demonstrating a 'desired' behaviour, for example via on-line videos showing people how to do a particular activity
- > **Commitment** i.e. asking people to commit to undertake a 'desired' behaviour via a public pledge
- > **Providing feedback on the behaviour** i.e. information on whether the behaviour has been successfully performed
- > **Rewarding** 'desired' behaviour, e.g. through some form of prize or payment
- > **Penalising** 'undesired' behaviour, e.g. by introducing taxes, penalties, or charging
- > **Building capability** i.e. supporting the development of skills and confidence with regard to 'desired' behaviours

There are several ways these interventions can be delivered. An intervention can come in the form of mass marketing focused on raising awareness, a pledge/commitment of a small social network, a more focused community engagement event, workshops sponsored by a community organisation, a council, or a corporate entity as part of their Corporate Social Responsibility activity, a training program organised by the employer to their employees, a national food avoidance day/week etc. Multiple tactics and tools may be required simultaneously or over time. These examples show interventions can be of varied sizes and forms.

Creating awareness about household waste and helping households overcome weaknesses relating to food provisioning could include providing helpful tools. Examples for such tools include fridge/freezer stickers, thermometers, portion measures, food huggers or silicone covers to keep food fresh, magnetic meal planners and portion cups that assist in identifying the correct portion size for pasta and rice, silicone tapes to allocate a designated area for oldest items, printed shopping lists, recipe books, and freezer containers.

Table 4 and Table 5 summarize potential interventions for priority behaviours and products and arose from the research undertaken through the Household Food Waste program (Karunasena & Pearson, 2022). Section 2.5 on messages in food waste reduction intervention outlines the most impactful message frames found to motivate participants to perform the target food waste behaviours. For further options on global best practice interventions refer to the executive summary in the report by Karunasena et al. (2020).

Table 4: Interventions focusing on behaviours (top seven)

Behaviour	Specific actions required	Interventions recommended for the priority behaviours
1. Preparing right amount of food	<p>Ahead of cooking the food:</p> <ul style="list-style-type: none"> > Plan how many meals need to be cooked during a week > Check how many people will be at home for meals > Make a meal plan (e.g. for a weekly shopping cycle plan to cook/prepare meals for four days and allocate 1-2 days for eating leftovers, take away and eating out) > Involve household members in planning meals <p>When cooking meals:</p> <ul style="list-style-type: none"> > Check how hungry people are and cook the appropriate amount of food based on their levels of hunger > Minimise extra food being prepared (to reduce the amount of leftovers) > Cook meals that were planned 	<ul style="list-style-type: none"> > Education and tools to support meal planning and food preparation: e.g. templates for meal plans, app-based tools for making shopping lists, recipe ideas for different ingredients and common leftover ingredients > Calculators and guides to help household food managers work out portions and amounts needed: e.g. cups/scales, calculator tools and apps, portions shown on packaging > Commitment techniques: e.g. have meal plans visible in a home and have household members agree to the plan/menu
2. Keep some flexibility when planning meals	<ul style="list-style-type: none"> > Check how many people will be at home for meals before planning and cooking meals > Allocate 1-2 days to eat the leftovers from other meals during week > Involve household members in planning meals 	<ul style="list-style-type: none"> > Education and tools to support meal planning and food preparation (as listed above) > Communication interventions encouraging checking in with other members of the family; making who will be at home for the meal visible in the household easily (via calendars, etc) > Communication interventions that focus on creating a “leftover day” or a “use-it-up day” as an integral part of meal planning.
3. Eat leftover food	<ul style="list-style-type: none"> > Store prepared leftovers in the fridge/ freezer > Label prepared leftovers with an ‘eat by’ date when storing them > Eat prepared leftovers before the ‘eat by’ date > Use leftover ingredients (i.e. un-prepared) before they ‘go off’ > Plan for a “leftover day” or “use-it-up day” when making their meal plans as part of their weekly meals 	<ul style="list-style-type: none"> > Providing recipe ideas for different ingredients and common leftover ingredients; and ways for household members to search for meal ideas based on ingredients > Interventions focused on creating a social norm around allocating/celebrating “leftovers day” and eating leftovers > Label templates, stickers, or tapes to have by the fridge to use on containers with leftovers > Setting aside an “use-it-up” or “eat me first” area or shelf in the fridge for things that need to be eaten sooner > Containers for leftovers with ‘Eat by date’ labels > Visual prompts on the outside and inside the fridge and other tools to increase motivation to use and eat leftovers > Making the “leftover day” or “use-it-up” day prominent in the home (e.g. nominating a leftover only day ahead of time, public commitments, prompts in the household)

Behaviour	Specific actions required	Interventions recommended for the priority behaviours
4. Purchase right amount of food	<ul style="list-style-type: none"> > “Shop your kitchen first.” Look in fridge/freezer/cupboards to check supplies available ahead of planning meals or purchasing items > “Shop for the meal plan.” Write a shopping list based on planned meals and existing supplies > Buy items on the list when shopping > Minimise impulse purchases of additional items 	<ul style="list-style-type: none"> > Communicate “Shop your kitchen first” idea for cost savings > Portion calculator and shopping lists in convenient forms and templates (e.g. web/app/paper) > Online and app-based shopping encouraged to avoid impulse buys > Provide tools and materials for labelling, storing, and arranging items in cupboards and fridges to make them easier to see (containers, labels, shelf inserts, etc)
5. Eat oldest food items first	<ul style="list-style-type: none"> > Label a section in fridge/freezer/ cupboards as “use me first” and store items in this section that need to be used > Eat these items first and encourage others to do same > Check and adhere to the ‘use by’ and ‘best before’ date labels > Use smell and sight to determine if food is OK to eat alongside use of ‘best before’ dates 	<ul style="list-style-type: none"> > Provide a product or tools (e.g. box, tray, tag for shelf, containers, labels) to identify products or leftovers that need to be used first (including those nearing their ‘use by’ and ‘best before’ dates) > “Prep Now, Eat Later” providing households helpful tips on preparing perishable foods soon after shopping. > Education and communications on differences between ‘use by’ and ‘best before’ labels > Standardise and simplify date labels on products > Provide simple rules-of-thumb for households to use to identify when food is no longer safe to eat
6. Store food in fridge/freezer	<ul style="list-style-type: none"> > Store products to optimise their shelf life (e.g. follow the on-pack instructions for storing items) > Ensure food is visible in storage spaces 	<ul style="list-style-type: none"> > Provide information on how to store all products correctly and encourage this through education > Visual prompts to remind participants how to keep produce fresh > Standardise and simplify date labels on products > Provide tools and materials for labelling, storing, and arranging items in cupboards and fridges to make them easier to see (containers, labels, shelf inserts, etc) and to know which needs to be used first
7. Start with smaller servings of food	<ul style="list-style-type: none"> > Offer small servings > Provide opportunity for people to have second helping 	<ul style="list-style-type: none"> > Allow people to serve themselves at mealtimes > Use smaller plates when serving

Source: Adapted from Ananda et al., 2021a and Karunasena et al, 2020

Table 5: Interventions focussed on most wasted food products (top five based on dollar value)

Products	Behaviours to encourage through interventions	Potential interventions
Beef (cooked)	<ul style="list-style-type: none"> > Correct use of fridge/freezer for storing items > Preparing correct amounts of food for meals and eating any leftovers > Serving smaller portions and encouraging finishing meals 	<ul style="list-style-type: none"> > Portion controlled packaging > Provide advice for storing cooked leftovers > Prompts with storage instructions e.g. fridge magnets/stickers, on pack storage suggestions > Storage reminders e.g. via food apps > Leftover cooking tips and recipes > Encourage smaller servings
Bread (sliced and rolls)	<ul style="list-style-type: none"> > Use of freezer to store bread > Keep some flexibility when planning meals for take-away and dining practices to avoid having leftover bread 	<ul style="list-style-type: none"> > Prompts with storage instructions e.g. fridge magnets/stickers on pack storage suggestions > Storage reminders e.g. via food apps, and rules-of-thumb for knowing when to freeze bread > Education and tools to support meal planning and food preparation so that households buy the right quantities of bread by leaving spaces for dining out/take away and eating leftovers > Provide advice for using bread in different ways when no longer fresh
Salads (using vegetables)	<ul style="list-style-type: none"> > Correct use of fridge/freezer for storing the items 	<ul style="list-style-type: none"> > Prompts with storage instructions e.g. fridge magnets/stickers, on pack storage suggestions > Storage reminders e.g. via food apps > Tips on how to keep salads fresh for long after opening the pack
Banana	<ul style="list-style-type: none"> > Correct storage practices to keep product fresh for long > Eating oldest items first (wasted due to preference to eat fresh) 	<ul style="list-style-type: none"> > Storing tips to keep food fresh for longer > Leftover cooking tips and recipes > Provide advice for using banana in different ways when no longer fresh
Cooked rice	<ul style="list-style-type: none"> > Planning meals > Cooking right quantities > Eating leftovers 	<ul style="list-style-type: none"> > Education and tools to support meal planning and food preparation e.g. templates for meal plans, app-based tools for list-making, recipe ideas for different ingredients and common leftover ingredients > Calculators and guides to help household food managers work out portions and amounts needed e.g. cups/scales, calculator tools and apps, portions shown on packaging > Storing tips to keep food fresh for longer > Leftover cooking tips and recipes > Involve household in meal planning

2.5. Communication plan

As part of the intervention, a good food waste reduction message will fulfill three important criteria. Firstly, the message frame selected will be attractive and stand out to the target audience. Secondly, the message will embed a call to action, requesting the target audience perform a single action/behaviour. Thirdly, the message and the action will be simple, amplified, and consistent.

2.5.1. Message frame

The message frame should seek to be attractive to the audience by telling them why they should care and what's in it for them. The research recommends saving money be the lead message frame used as a hook to engage audiences. This initial frame can then be followed up and supported by frames of loss aversion (e.g. money you throw away each week by wasting food) or highlighting the waste of environmental resources (e.g. water, energy, transport involved in producing food).

It is recommended the message frames be optimised in the following ways:

- > **Save money:** Using clear, real-world examples of what audiences could do now and how much money they would save through addressing waste e.g.
 - Preparing appropriate amount of food could save your family X dollars per week
 - Focusing on the cost-saving benefits of using already purchased food, communicated by the phrase, "Shop your kitchen first" (U.S. EPA, 2016)

- > **Personal loss / loss aversion:** This frame could be linked to monetary value and enacted with a visual prompt in the home – such as a sticker on the kitchen bin. This would assist in reminding people to try and use their food rather than throw them out e.g.
 - A visual message of throwing money into the bin could be a creative expression of this frame.
- > **Environmental resources / saving environment:** This frame brings attention to where food comes from. It includes the water used in producing the food, the energy from production and transport as well as packaging material used. However, care must be taken not to draw too big a link to the broader climate change issues as audience may feel it is a too big a problem for them to be able to contribute to addressing e.g.
 - "Consider the Tomato" tool is designed to attract attention to and raise awareness of the issue of wasted food. It tells a story about why wasted food matters and provides context for wasted food as an environmental and economic issue" (U.S. EPA, 2016, p. 8).

2.5.2. Action to perform

After getting the attention of the audience, which includes an appropriate message frame, it is necessary to tell them what action they need to perform. The 'audience, target, action, context, time' (ATACT) framework is helpful to define the behaviour the target audience will be requested to perform e.g. Food manager (audience) in households (context) creates a weekly meal plan (action) before going to the shops (time) in order to reduce avoidable food waste (target) in their homes. Then craft your call to action and message to ensure this is able to be easily understood and undertaken.

Table 6 lists the overall priority behaviours and the specific supporting behaviours that can be encouraged through the intervention. This more detailed list of behaviours helps identify specific actions to be encouraged by the intervention.

Table 6: Priority behaviours and supporting behaviours to be encouraged with the intervention

Main behaviour to encourage	Supporting behaviours to encourage			
1. Purchase appropriate amounts	Check the fridge/ cupboard to use oldest items first e.g. "Shop your kitchen first"	Create a meal plan	Create a shopping list based on the meals planned	Stick to the shopping list
2. Plan for changes in plan: Ensure the meal plan has the flexibility to accommodate unexpected changes	Think of how many meals need to be cooked during the week	Check how many people will be at home during the week to eat the meals.	Make a meal plan for four days and leave the rest of the days to eat leftovers resulting from unexpected event or take outs and/or deliveries.	Be sure to cook meals that were planned
3. Prepare appropriate amounts	Before cooking, check hunger levels of those will be home to eat the meal	Before cooking, think carefully about the quantities needed to prepare the meal	Measure the ingredients necessary for the meal	
4. Small plate serves	Check hunger levels before serving	Serve small quantities	Offer second helpings	Encourage leaving nothing on the plate
5. Eat Leftovers	Have a "leftovers day" or "use it up day" every week	Use appropriate freezer/reheating containers to store leftovers	Label and store leftovers correctly in the fridge or freezer	Eat leftovers later on
6. Use oldest food items first	Allocate a "Use it up" or "Eat me first" area in the fridge/ freezer/cupboard	Encourage everyone in the house to use food in the "use it up" area	Develop the meal plan using oldest food items	Check the "use it up" area before making a shopping list

2.5.3. The message delivered should be simple, amplified and consistent

One action per message: Only ask one action to be performed per message. Asking the audience to perform multiple actions could confuse them or make them feel the effort required is too much.

Keep messages jargon-free and test them: Use language the audience uses (not what food waste experts use) and test to make sure audience understands it.

Use accessible language and content that does not exclude audiences: Consider using infographics and visuals instead of text. With text, as a guide, ensure a 10-year-old can understand it. Consider different language and cultural groups and how they would best receive a message.

Amplify the message by delivering it through multiple channels: use multiple channels such as TV, radio, social media, newspapers, packaging, billboards, fridge magnets etc. to deliver the chosen message repetitively, over a long period of time.

Ensure consistency of messages delivered: Ensure all media channels and all stakeholders communicate the same, or complementary, messages.

2.5.4. Identify communication methods

Television and radio are good methods for reaching larger audiences. However, these methods are expensive. As such, websites, YouTube, App, school/university curriculums and social networks such as Facebook, Instagram and TikTok are quite popular alternative methods. Prior research advocates the use of one-to-one channels and word of mouth channel as effective methods of passing on food waste reduction messages (Karunasena et al., 2020, p 36). Examples of such activities include community engagement workshops by Inner West councils Sydney, corporate training programs by Zero Waste Scotland, and cooking classes on preserving food or cooking with leftovers.

2.5.5. Identifying stakeholders / delivery partners and ensuring all partners and channels to deliver messages consistently

Partnering with other organisations who share the intervention using their own channels will help create momentum. Partnering with supermarkets, charities, manufacturers, food rescue organisations, food delivery organisation local community groups, and event organisers, influencers such as chefs, TV presenters to share key messages and tools with your target audience are options to consider. For example, WRAP UK partnered with Tesco home delivery service. When their drivers delivered the home delivery crates, a flyer was placed on top of the shopping bags with the week's food saving tip. WRAP also partnered with the National Federation of Women's Institute to get tips on reducing food waste.

2.6. Behaviour change frameworks

Numerous approaches and frameworks have been developed and used to assist in organising activities seeking to achieve changes in behaviour. Opportunity-Motivation-Ability (OMA) and the Easy, Attractive, Social and Timely (EAST) frameworks offer a powerful combination for understanding and developing activities seeking to encourage households to reduce the amount of food they waste. These frameworks assist in applying behaviour science concepts in food waste reduction interventions (National Academies of Sciences, Engineering, 2020). The combined use of these frameworks help guide the development of household food waste interventions.

The Opportunity Motivation Ability (OMA, or MOA) framework (Figure 5) is useful in creating a detailed understanding of the particular issues needing to be considered for activities seeking to reduce consumer food waste (van Geffen et al., 2020).

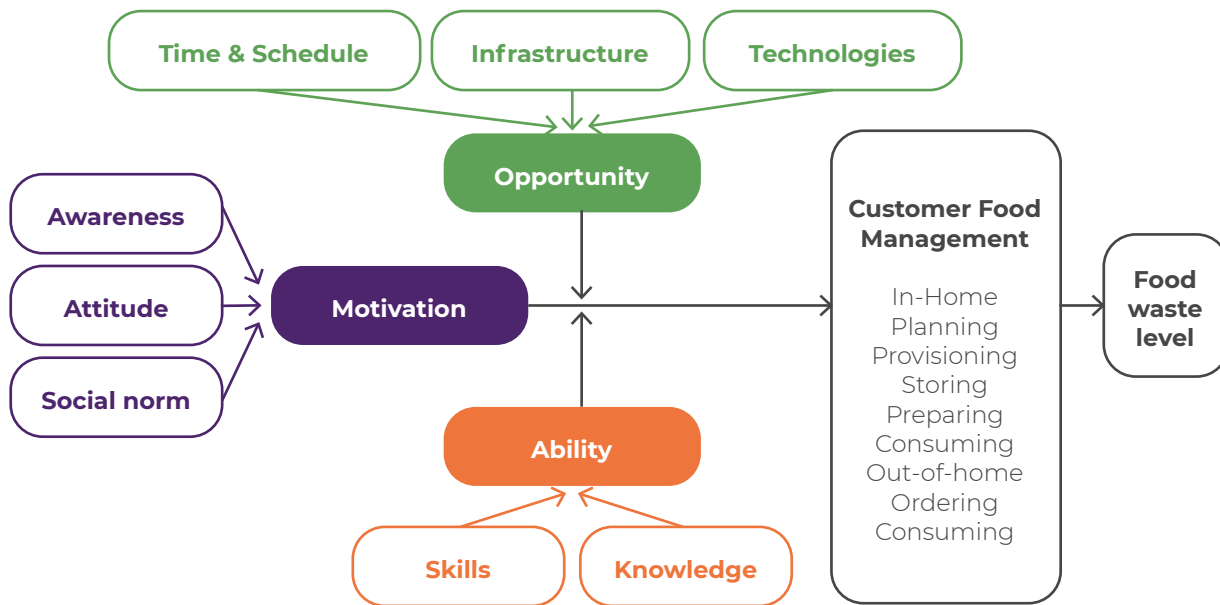


Figure 1: Motivation Opportunity Ability framework

Source: van Geffen, van Herpen, van Trijp, (2016)

The EAST framework by the Behavioural Insights Team in the UK is a straightforward framework to encourage a behaviour by seeking to make the change Easy, Accessible, Social and Timely (Four Simple Ways to Apply Behavioural Insights <https://www.bi.team/publications/east-four-simple-ways-to-apply-behavioural-insights/>).

Both frameworks can help program teams generate ideas for specific tools and tactics to make the behaviours easier to do.

2.7. Ethics and other approvals

Depending on the organisation responsible for implementing the intervention, there could be board and/or committee approvals that need to be obtained before implementing an intervention. Hence it is necessary to allocate enough time to complete this step e.g. University Ethics Committee.

2.8. Timeline

Planning through to implementation and evaluation takes a substantial amount of time. For example delivering a small intervention could take five to eight months to complete. The following questions will guide you on the type of decisions needed to make regarding timing of delivery:

a) What is the best time to implement the intervention?

Consider the impact (both positive and negative) of time of year e.g. during a school or non-school holiday period, in the month/ weeks leading to or during special events such as Christmas or Easter.

b) How long will the intervention last?

- e. g. a minimum duration of six weeks of exposure is considered necessary to change behaviours. This emphasises the importance of consistent messaging to be delivered until performing the behaviour becomes a habit.

c) When will the pre and post evaluations be conducted?

- Recruitment for pre-evaluation should begin at least 2 weeks before the intervention commences (for further details refer Section 2.9 Evaluation and Stage 3 Evaluation and feedback).

2.9. Evaluation

Evaluation is essential to understand the impact of an intervention. This is the only way to know if the intervention was successful achieving the objectives set. This information also helps guide decisions around repeating or modifying the intervention in future. The following questions need to be answered at the planning stage.

a) How will impact of the intervention be measured?

- e.g. change in targeted behaviours, reduction in product or categories or total amount of food waste, number of people reached, number of people engaged with the intervention, changes in awareness levels.

b) How many evaluations?

- e.g. pre-evaluation, post evaluation immediately after completing the intervention, post evaluation four to five weeks after completing the intervention (to identify when change in behaviour has been maintained).

c) What tools will be used to gather data?

- e.g. survey, electronic diary, bin audits, videos, interviews.

d) How will changes in food waste be measured?

- e.g. get participants to estimate their waste or provide photographic/ video evidence, audit bins.

3

Stage 2: Implementation

Summary of Stage 2: Implementation



3.1. Develop and test the data collection tool with the help of food waste and evaluation experts



It is important to use a data collection tool that provides an accurate measurement. There are a number of tools such as surveys, electronic diaries, bin audits, focus groups and observations to collect data. Surveys are a cost-effective tool that can quantify both pre-intervention baseline behaviours and waste quantities. Thus, it is necessary to use valid questions (See Appendix) or develop questions with the help of experts, and test whether participants interpret those questions correctly.



Tips:

When using surveys:

- > Questions should be easy to understand. Remember participants come from all walks of life and are not food waste experts
- > The survey that would take no more than 10 minutes to complete is recommended
- > Always test the survey
- > Share final survey with 10-15 participants prior to release, modify survey based on their feedback and an analysis of responses (to check answers to questions are helpful)
- > Check the survey works on both desktops and mobiles (on phones using Android and Apple operating systems)

3.2. Obtain baseline data about current food provisioning behaviours in target audience



A survey offers an effective way to gather data on behaviours, attitudes, awareness along with waste quantities (see example in Appendix).



Tips:

When using surveys:

- > Ensure survey is sent out at least a week in advance of starting the intervention
- > Leave the survey open for a week to allow time for participants to fill it in
- > Send reminders (e.g. emails or text messages) prompting participants to fill the survey

3.3. Develop and test communication content to suit the audience using behaviour experts and communications and engagement personnel



Before the launch of the intervention pilot, test content with sample from target audience, obtain feedback and adjust (content, colours, images, font sizes etc.) according to feedback.

3.4. Communicate using methods that can best reach your target audience



Select channels or methods that are widely used by those in the target audience. Continuous monitoring and adaptation of the intervention (such as using new channels) helps to ensure the target audience is reached. Often reaching younger people, such as in the 18-25 year old age group is challenging and hence requires focused efforts. You might also want to give special attention to reach Culturally and Linguistically Diverse (CALD) audiences by customising messages and channels. Using the right partners (e.g. supermarkets, community organisations) to create and maintain the momentum for the intervention is crucial for achieving impact.

3.5. Implement the intervention



Putting a project manager in place ensures the intervention will be implemented effectively and there is someone taking it from plan to reality, and monitoring progress. The project begins by recruiting participants to gather baseline data.



Tips:

- > Request the project manager to monitor the progress and report and any issues as early as possible
- > Set up regular meetings (e.g. fortnightly) to discuss progress, issues and solutions
- > Start the recruitment of participants a few weeks in advance of the intervention

3.6. Continue to monitor participants' engagement and take interim feedback



Early detection of lack of response is crucial for the success of the intervention. If you notice this, be ready to use alternative methods to reach your audience and where possible, make adjustments in response to feedback.



Tips:

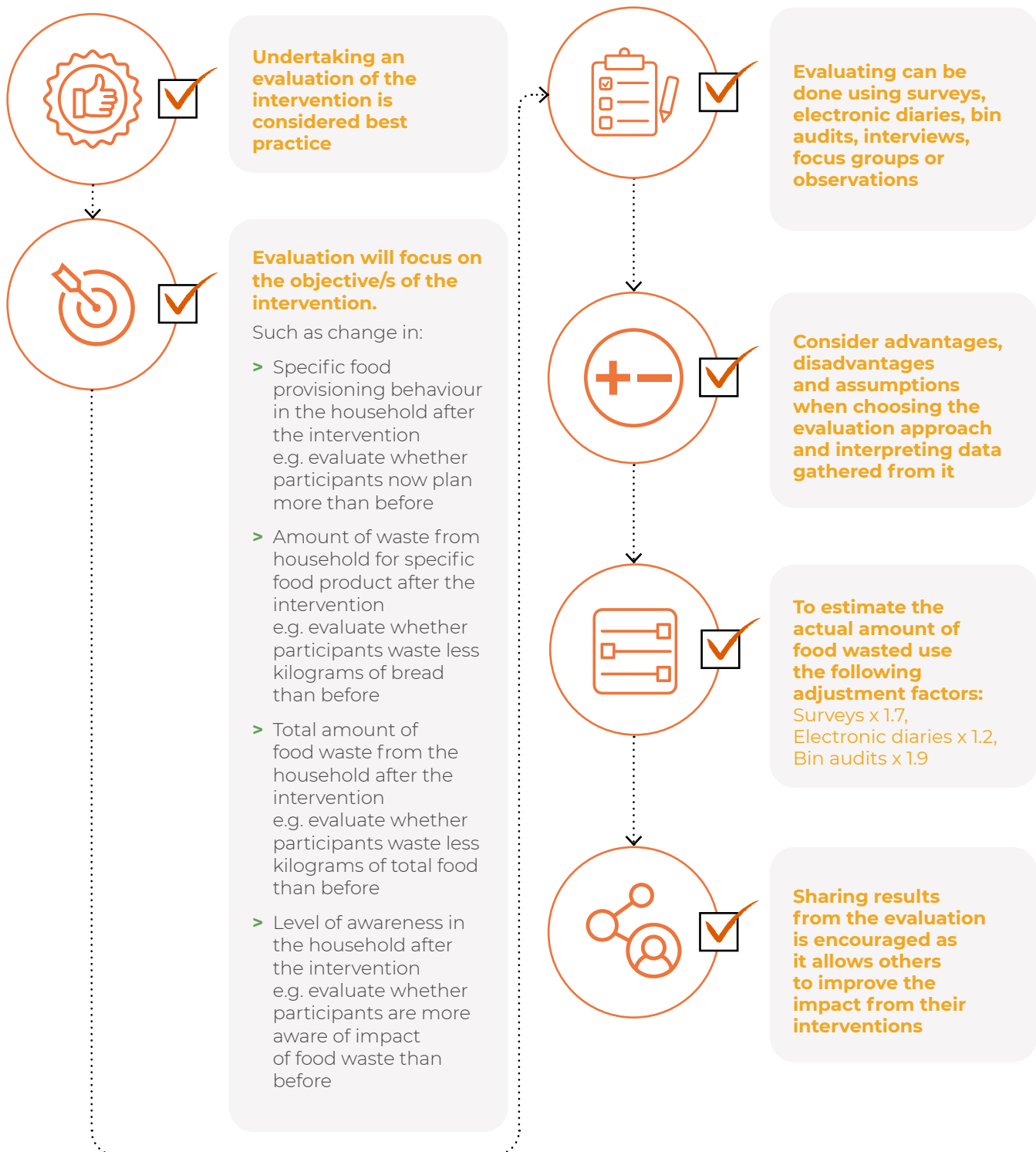
- > Keep monitoring progress and engagement with the intervention in the target audience.
- > Ensure all participants are able to give feedback
- > Make sure feedback (including complaints) is handled professionally and promptly



4

Stage 3: Evaluation and feedback

Summary of Stage 3 - Evaluation and feedback



4.1. Evaluating Interventions

It is important to use a data collection tool that provides an accurate measurement. There are a number of tools such as surveys, electronic diaries, bin audits, focus groups and observations to collect data. Surveys are a cost-effective tool that can quantify both pre-intervention baseline behaviours and waste quantities. Thus, it is necessary to use valid questions (See Appendix) or develop questions with the help of experts, and test whether participants interpret those questions correctly.

An evaluation helps understand what works as well as what does not. Thus, it is important to see evaluation as a learning exercise rather than framed solely as the success of an individual's task. Depending on the type of intervention, you can choose to measure the change in behaviours, weight of a given product and/or total weight in food waste, awareness.

We recommend identifying baseline data on behaviours, products, total waste and/or awareness prior to the intervention (pre-intervention baseline), then assessing the same factors immediately after the intervention.

In addition, it is ideal to assess the long-term impact of the intervention by doing another round of evaluation using the same instrument 6 weeks after the intervention has ended. This will help to understand if the intervention had lasting effects, or the change was only short-lived.

4.2. Measuring changes to priority behaviours

Previous work has identified priority behaviours for interventions to reduce household food waste in Australia (Ananada et al). The questionnaire in the Appendix presents questions that could be used to assess the changes in the seven priority behaviours:



Tips:



- > Surveys longer than 15 minutes lead to higher attrition rates, if not compensated sufficiently
- > If you are evaluating several behaviours using the same intervention, it is recommended to pick 2-4 questions representing each behaviour from the list of questions in the survey presented in Appendix
- > Unless it is an intervention focused on increasing awareness targeting the mass market, it is a good idea to screen your participants to ensure only those who are at least 50% responsible for food provisioning behaviours are evaluated. Anything less, could mean the answers they provide are not based on their own experience and are hence invalid

4.3. Measuring changes to the weight of product or total household food waste

The most commonly used tools for measuring total household food waste, or that of a specific food category or food product, are a survey, diary or bin audits. Surveys are the most cost-effective methods of gathering data. However, self-estimation by participants leads to an underestimation of food waste. Food waste diaries are useful if you are trying to capture real time waste data as well as disposal routes. Further, diaries are able to

capture disposal of several products at the same time. However, it requires a lot of effort by the participants leading to higher attrition rates. Bin audits are the most accurate at estimating food waste. However, they are expensive on a per respondent basis and do not collect data on food disposed of through other routes such as feed to pets, composted at home or down the sink. Moreover, it is difficult to identify product level data as waste is mixed and at times unidentifiably decomposed. Table 7 presents a summary of factors to consider when deciding a measurement instrument (Ananda et al., 2021a).

Table 7: Factors to consider when selecting a measurement instrument

Instrument	Advantages	Disadvantages	Cost (estimates in 2022)
 <p>Survey</p>	<ul style="list-style-type: none"> > Comparatively economical method > Facilitates gathering of behavioural and food waste information simultaneously 	<ul style="list-style-type: none"> > Relies on self-reports (e.g. estimate over last seven days) – which can be affected by bias > Underestimates food waste. 	<ul style="list-style-type: none"> > \$22 per participant for a 15-minute survey. > Minimum 1000 participants.
 <p>Diary</p>	<ul style="list-style-type: none"> > Enables the measurement of (value and weight) of food waste by specific products (e.g. cooked beef, banana etc.) which can be aggregated into food categories (e.g. meat, fresh vegetable etc.) and total food waste. > Captures waste when it occurs (e.g. diary entries four times per day over seven-day period) > Can include data on where food disposed of – providing more context behind the behaviours. 	<ul style="list-style-type: none"> > Requires large amount of input (time and effort) of both diary participants (to log information) and the researchers (to analyse). > The act of recording food waste has the potential to influence behaviour – making the measurement an intervention. > Large effort is required from diary participants requires high levels of compensation to ensure they stay involved > Relies on self-reports which can be affected by bias. > Underestimates food waste. 	<ul style="list-style-type: none"> > \$65 per participant for 7 day electronic diary. > Minimum 1000 participants.
 <p>Bin Audit</p>	<ul style="list-style-type: none"> > Most accurate it measures actual waste and limits self-reporting bias 	<ul style="list-style-type: none"> > Only captures one disposal route (as does not include home compost, fed to animals at home, poured down the sink) > Expensive on a per participant basis 	<ul style="list-style-type: none"> > \$300 per participant > Minimum of 100 participants.

Source: Adopted from (Ananda et al., 2021b)

4.2.1. Adjustment factors for estimate of total food waste

The accuracy of an estimate of the total amount of food waste is improved when scaling factors are used. This means that for whatever method you choose, you should multiply the results you get by a different factor. That will provide you with a much more accurate result.

Table 8: Scaling factors to use when estimating total amount of food waste

Table 8: Scaling factors to use when estimating total amount of food waste

Methods to measure household food waste



Survey
Scaling Factor 1.7

> Survey is recommended as most cost-effective method



Electronic-Diary
Scaling Factor 1.2

> All methods have limitations and underestimate food waste in households



Bin Audit
Scaling Factor 1.9

> Accurate weight of food waste is determined by multiplying the total food waste derived by the method used, by the relevant scaling factor

4.4. Learning and feedback loop

Future interventions can only be improved if the learning is passed on among everyone involved and those who will be undertaking similar interventions in the future. (e.g. Netherland Nutrition Centre had three meetings with their partners before their annual food waste avoidance week and discusses key learnings from the previous year and strategies on how to avoid those mistakes).

The intervention concludes with a closure meeting where all stakeholders who were involved discuss the following:

1. What worked
2. What did not work
3. Problems faced and how those were solved
4. How would you plan, implement, and evaluate the intervention differently next time

And finally, keep a record of learnings, content shared and data collected so that anyone planning an intervention in future can learn from it.

5

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6

Appendix: Survey to evaluate impact from intervention

Survey to evaluate seven priority behaviours focussing on reducing amount of food not eaten and hence disposed of

Instructions

When you are completing the survey, please ensure you read all instructions carefully before selecting your answer. At the end of the survey, please ensure that you click 'submit' to ensure your responses are collected.

Screening Questions

S1: Do you agree to participate and answer all questions honestly?

- Yes
- No (Thanks and close)

S2: Age How old are you?

- Under 18 (Thanks and close)
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65+ years old

Meal planning, shopping, storing, cooking and disposing are known as food provisioning behaviours.

S3: How responsible are you in performing these food provisioning behaviours in your household?

- I'm not responsible for performing any of the above food provisioning behaviours in my household (Thanks and close)
- I'm fully (75 or more %) or jointly (50-75%) responsible for performing above food provisioning behaviours in my household

Q1: Please provide a valid email address for us to contact you with information on helping you to reduce amount of food not eaten and hence disposed of.

Q2 Enter your post code _____

Measuring interventions focused on encouraging the behaviour 'prepare right amount of food'

(delete this heading in the questionnaire sent to potential respondents)

Q3: When preparing food, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	When preparing a meal, I check with my household about their hunger levels	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	When preparing a meal, I think carefully about the quantities that will be eaten	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	When preparing a meal, I prepare extra food just in case it will be eaten	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
D	When preparing a meal, I find it difficult to estimate how much food my household will eat	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour 'keep some flexibility when planning meals'

(delete this heading in the questionnaire sent to potential respondents)

Q4: When planning for meals, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	I plan the meals to be prepared	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	My meal plan includes space for eating out or meal delivery (i.e. for 5-days, make meal plans for only 4 days)	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	I include gaps in my meal plan for an 'eating leftovers' day	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
D	I don't cook the meals I planned due to changes in activities (work schedules, social engagements, household members don't turn up for meal etc.)	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour 'eat leftover food'

(delete this heading in the questionnaire sent to potential respondents)

Q5: With leftover food, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	Prepare extra food which is not eaten, and dispose of these leftovers straight away	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	Prepare extra food, store these leftovers, and end up eating them	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	Dispose of uncooked foods because I don't know how to use them (e.g raw potato, raw beef, half an onion)	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
D	Dispose of cooked foods as I don't know how to use them (e.g cooked potatoes, cooked beef)	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour 'purchase right amount of food'

(delete this heading in the questionnaire sent to potential respondents)

Q6: When shopping for food, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	I plan the meals to be cooked	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	I plan for the quantities of ingredients needed to prepare the meals I planned	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	I write a complete shopping list of everything needed based on my meal plan	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
D	I only buy what is on the shopping list	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
E	I find it difficult to estimate how much food I need to buy	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour 'eat the oldest food items first'

(delete this heading in the questionnaire sent to potential respondents)

Q7: When using the oldest food items first, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	I try to use up the oldest food first	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	I'm not sure what 'best before' and 'use by' dates mean	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	I have a 'use it up' area in the fridge/ cupboard for food I need to use first	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
D	I find it difficult to estimate if food is still safe to eat based on looking, smelling or tasting it	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour 'store food in the fridge or freezer'

(delete this heading in the questionnaire sent to potential respondents)

Q8: When storing food, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	I move the oldest food items to the front or top so that they can be used first	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	I use storage containers to keep food for as long as possible	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	I don't know how to store food correctly so it is kept fresh for as long as possible	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Measuring interventions focused on encouraging the behaviour ‘start with smaller servings of food’

(delete this heading in the questionnaire sent to potential respondents)

Q9: When serving food, how often do you, or other members of your household, do the following?

Please choose one answer in each row.

		Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)
A	I let others serve themselves	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
B	I encourage serving small quantities with option for second servings	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁
C	Household members do not eat all the food on their plates	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁

Amount of food disposed of

(delete this heading in the questionnaire sent to potential respondents)

Q10: How many cups of edible food did you, and other members of your household, discard during last week?

Please **include all edible food** discarded through waste bin, feeding pets and other animals, composting etc. **Do not include inedible food** such as bones, peels, skins, shells, cores etc.

Type a number

Food categories

(delete this heading in the questionnaire sent to potential respondents)

Q11: Based on its contribution to the total food disposed of, rank the following categories from most wasted (1) to the least wasted (5) food categories?

(Do not include inedible food such as bones, peels, skins, shells, cores etc.)

Category	Ranking (1-5)
Meat and Seafood (e.g. cooked or uncooked chicken, beef, fish, prawns)	<input type="radio"/> ₁ <input type="radio"/> ₂ <input type="radio"/> ₃ <input type="radio"/> ₄ <input type="radio"/> ₅
Fresh vegetables and herbs (e.g. salad leaves, cabbage, potato, beans, carrot)	<input type="radio"/> ₁ <input type="radio"/> ₂ <input type="radio"/> ₃ <input type="radio"/> ₄ <input type="radio"/> ₅
Leftover cooked meals (e.g. cooked chicken, beef, rice, pasta, spaghetti, stir fried vegetables)	<input type="radio"/> ₁ <input type="radio"/> ₂ <input type="radio"/> ₃ <input type="radio"/> ₄ <input type="radio"/> ₅
Bread and bakery (e.g. slices bread, bread rolls, pies, muffins, pastries)	<input type="radio"/> ₁ <input type="radio"/> ₂ <input type="radio"/> ₃ <input type="radio"/> ₄ <input type="radio"/> ₅
Fresh fruits (e.g. banana, apples, berries)	<input type="radio"/> ₁ <input type="radio"/> ₂ <input type="radio"/> ₃ <input type="radio"/> ₄ <input type="radio"/> ₅

Motivation

(delete this heading in the questionnaire sent to potential respondents)

Q12: How motivated are you to reduce the amount of food that is not eaten and hence disposed of in your household?

- I am already doing this most of the time
- I do this, but just some of the time
- I do not do this, but have decided to start doing it
- I do not do this, but I am thinking about it
- I do not do this, and have no plans to start doing so

Demographics

(delete this heading in the questionnaire sent to potential respondents)

Q13: How many people in each age group usually live at your household?

*Please include them if they live with your half the time or more.

*Please insert number of people in each row.

*Insert zero if no one in that age group is living in your household.

- 0-9 year olds _____
- 10-19 year olds _____
- 20-44 year olds _____
- 45-64 year olds _____
- 65+ year olds _____

Q14: How do you describe yourself?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Q15: Which of the following best describes your household income (before tax)?

(This refers to the total income from all people in the household, and includes income from wages and salaries, government benefits, pensions, allowances and any other income you usually receive. It is before deductions for income tax and superannuation contributions)

- No or negative income
- 0- \$999 per week (0-\$51,999 per year)
- \$1,000-\$1,999 per week (\$52,000-\$103,999 per year)
- \$2,000-\$2,999 per week (\$104,000-\$155,999 per year)
- \$3,000-\$3,999 per week (\$156,000-\$207,999 per year)
- \$4,000-\$4,999 per week (\$208,000-\$259,999 per year)
- \$5,000-\$5,999 per week (\$260,000-\$311,999 per year)
- \$6,000 or more per week (\$312,000+ per year)

Changing behaviours

(delete this heading in the questionnaire sent to potential respondents)

Q16: If you were to change your food purchasing, storing, preparing and disposal behaviours to reduce the amount of food not eaten and hence disposed of, how much effort would be required?

	In your view changing behaviours to:	No effort at all	Not much effort	Neutral	A fair bit of effort	A lot of effort	Don't Know
A	Preparing right amount of food takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
B	Keeping some flexibility when planning meals takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
C	Eating leftover food takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
D	Purchasing right amount of food takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
E	Using oldest food items first takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
F	Storing food correctly in fridge and freezer takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉
G	Starting with smaller servings of food takes	<input type="radio"/> ₅	<input type="radio"/> ₄	<input type="radio"/> ₃	<input type="radio"/> ₂	<input type="radio"/> ₁	<input type="radio"/> ₉₉

Q17: In your opinion

	Almost every time (over 90%)	Most times (about 75%)	Half the time (about 50%)	Sometimes (about 25%)	Rarely / Never (less than 10%)	Don't Know
A It is possible to reduce amount of uneaten food that needs to be disposed of	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1	<input type="radio"/> 99

Post evaluation survey would include these additional questions as well.

PE 1 Which of the following activities organised by did you take part in?

Activity name	I took part in this
A Workshop 1 on reducing amount of uneaten food that needs to be disposed of	<input type="radio"/>
B Received tips and tricks to reduce food waste via email	<input type="radio"/>
C Watched videos on how to reduce household food waste	<input type="radio"/>
D Took part in a 6 week food waste reduction challenge	<input type="radio"/>

PE 2: How helpful was this information in reducing food you disposed of in your household?

In your view changing behaviours to:	Very helpful (over 75%)	Somewhat helpful (about 50%-75%)	Made no difference	Not very helpful (about 25-50%)	Not helpful at all (less than 25%)
A Preparing the right amount of food was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
B Keeping some flexibility when planning meals was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
C Eating leftover food was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
D Purchasing the right amount of food was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
E Using the oldest items first was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
F Storing food correctly so it keeps for as long as possible was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1
G Starting with smaller servings of food was	<input type="radio"/> 5	<input type="radio"/> 4	<input type="radio"/> 3	<input type="radio"/> 2	<input type="radio"/> 1



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