



Case studies on household food waste reduction interventions

This research was commissioned by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), for the *'Evaluating the impact of priority household food waste reduction interventions'* project within the Fight Food Waste Cooperative Research Centre. This project also developed a toolkit for designing household food waste reduction interventions. This has been presented in the report: Karunasena, G.G., Ananda, J. and Pearson, D. (2023) *Household food waste reduction toolkit: A step-by-step guide to designing interventions in Australia*. Fight Food Waste Cooperative Research Centre, Adelaide. Australia.

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Summary of Recommendations

Food waste costs the Australian national economy \$36 billion a year.

Households are the single greatest contributor to food waste in Australia, accounting for \$19 billion of waste annually (Food Innovation Australia Limited, 2021). Supporting households to reduce their food waste is important if Australia is to meet the National Food Waste Strategy target of halving Australia's food waste by 2030, in line with the United Nations' Sustainable Development Goal commitments (Goal 12.3).

Interventions such as information sharing, role-modelling, public commitments, goal-setting, and negative or positive reinforcements are used to reduce household food waste. However, there is a lack of robust evaluations to investigate the effectiveness of these interventions in reducing food waste and/or changing food waste-related behaviours (Cooper et al., 2023; Karunasena et al., 2020). Further, not many global household food waste interventions use evidence-based consumer insights to design their interventions (Kim et al., 2019).

As such, the *Evaluating the impact of priority household food waste reduction interventions project*; the *Evaluation of Interventions project* critically and independently evaluated the effectiveness of several priority household food waste reduction interventions based on their ability to reduce waste and change food provisioning behaviours. The interventions evaluated were guided by the evidence-based priorities (behaviours, food categories and products) (Ananda et al., 2021) previously identified by the Fight Food Waste CRC in *Designing effective interventions to reduce household food waste project*; the *Household Project* (Karunasena & Pearson, 2022). The project findings will inform the approaches in Australia of governments, businesses, industry and non-government organisations to address the consumer behaviour changes needed to reduce household food waste. This report presents the findings of two case

studies of interventions seeking to reduce household food waste in Australia.

The project began by selecting sponsors (organisations which will sponsor the implementation of household food waste interventions) who would roll out selected interventions aimed at reducing household food waste. In consultation with sponsors, a strategy was developed for implementing and evaluating each intervention. This report presents household food waste reduction interventions implemented by Inner West Council (IWC) and Eat Well Tasmania (EWT).

IWC organised three face-to-face workshops, sent food waste reduction tips through email newsletters, and gave residents the opportunity to complete a free online short course on reducing household food waste. They targeted younger households (18-35 years) and encouraged meal planning, eating leftovers and storing food properly to extend its life. These intervention reduced the food waste of 45% of participants who took part in any of the interventions. When it came to the perceived effectiveness of the IWC food waste reduction interventions, 62% of participants rated the intervention's coverage of storing food correctly and eating leftover food as either *Very helpful* or *Somewhat helpful*. Although not statistically significant, the food waste amounts reported in the second post-intervention survey represented an average 30% reduction from the baseline.

EWT developed and shared three 10-minute videos encouraging viewers to eat oldest food items first, eat leftovers and store food properly to extend its life. This intervention reduced the food waste of 38% of participants. Setting up a 'use it up' area in the fridge or pantry had a positive, statistically significant impact on participants in the EWT intervention. When it came to the perceived effectiveness of the EWT food waste reduction intervention, 77% of participants rated learning and using new cooking skills from the intervention as either *Very helpful* or *Somewhat helpful*, while 76% of participants rated the leftover food management aspects as either *Very*

helpful or Somewhat helpful. The average food waste reduction in the EWT target audience between the pre-intervention and the second post-intervention survey was 8%, although this was not statistically significant.

The following recommendations are provided based on the learnings from designing, implementing and evaluating these two interventions. These recommendations aim to help practitioners who design, implement and evaluate household food waste reduction interventions to optimise the impact of their interventions.

Recommendations

Recommendation 1: Where possible, include food waste avoidance as a key organisational objective and set key performance indicators.

Having a clear food waste avoidance objective and key performance indicators (KPIs) for the organisation supports the allocation of financial and human resources. Having such objectives will also help to justify the need to develop adequately resourced food waste avoidance interventions within the organisation. Without them, driving such activities will rely on one or two people's motivation, and those people will often be poorly resourced or burdened with many other activities.

Recommendation 2: Collaborate with other delivery partners to achieve resource efficiencies and increase impact.

Most organisations operate with limited resources, which may affect the impact they can have on food waste on their own. Collaborations could be in areas such as intervention planning, implementation, evaluation or knowledge sharing. Collaborations create efficiencies, helping to improve the pooling of resources, such as tapping into the skills and expertise of other partners. For example, collaboration

may improve audience reach if all partners use their own multiple media platforms to communicate with the target audience.

Recommendation 3: To reduce confusion, pay attention to the content delivered and how it is delivered when using external organisations to deliver food waste messages.

It is easy to lose control of messaging when collaborating with multiple partners. As such, extra care needs to be given to the content delivered and how it is delivered when using external individuals and organisations (including speakers) to deliver food waste messages related to the intervention. Check the coherence of external content developed in advance including presentations, media releases, social media posts and timing of releases. This will help to ensure that consistent and complementary messages are delivered about priority behaviours and products within agreed timeframes.

Recommendation 4: Put in extra effort when developing interventions which focus on the most impactful behaviours, particularly if they are not the most attractive behaviours for consumers.

In most interventions, including the interventions evaluated in this report, practitioners are interested in delivering interventions which encourage eating leftovers. However, to increase the impact on reducing food waste, it is important that interventions promote those behaviours which are known to be most impactful, and to do so in a way that is attractive to participants. For households in Australia, the evidence from comprehensive research shows that these behaviours are preparing appropriate amounts, developing flexible meal plans, eating leftovers, purchasing the right amounts of food, eating oldest items, storing food correctly and encouraging small servings.

Recommendation 5: Select no more than three behaviours per intervention.

Focusing on two to three impactful behaviours relevant to the target audience will make the intervention simple and effective. Including more than three food waste reduction behaviours in the same intervention is likely to overload the consumer and hence dilute the impact of the intervention. Further, many behaviours can be broken down into different actions. Given this potential complexity, it is important to simplify messages around which behaviours need to be adopted or changed by the target consumer.

Recommendation 6: Develop and test interventions and deliver customised messages through platforms that relate to your target audience.

Spend time to understand your audience – their needs, motivations/counter-motivations, opportunities, skills, lifestyle, influencers etc. Where possible, as the next step test the intervention, messages and evaluation with a sample of your audience. The difficulty of recruiting younger audiences for food waste interventions is widely acknowledged.

Lack of engagement from younger age groups was observed in both case studies presented in this report, despite them comprising the target group. As such, future interventions targeting younger age groups could be tested and delivered through platforms used by this cohort such as TikTok or online games. These platforms could provide young people with challenges to compete with their peers and opportunities to share their achievements and skills.

It is recommended that future interventions use a pre-survey to identify food provisioning behaviours which an individual is weak on and to design customised messages aimed at improving pre-identified weaknesses. Such customisation of messages would make information received by the target consumer more relevant to the issues they face.

Recommendation 7: Use interesting interventions that also engage the target audience.

The two case studies presented in this report provide evidence that engaging and interesting interventions achieve better impact by capturing consumer attention which then leads to changes in food waste behaviours. On the other hand, while sending an email is a very low-cost option, evidence from these case studies indicates it is not as effective in reducing food waste on its own.

Some suggestions for interesting and engaging interventions to trial in future:

- a. Introducing commitments/ pledges/ goal-setting and challenges followed by sharing practical solutions and tools to achieve those commitments.
- b. Using engaging workshops and prompts, alone or in combination.

Recommendation 8: Continuously monitor participant engagement and take actions to improve involvement.

Continuous monitoring of participant engagement is crucial for the success of interventions. Being ready to use alternative methods to reach your audience, and where possible make adjustments to interventions in response to feedback.

Recommendation 9: Conduct post-intervention evaluations.

A post-intervention evaluation helps understand what works and what doesn't. The following suggestions can improve the effectiveness of evaluations:

- a. Sending a message prior to the pre-survey requesting that participants be more aware of their next week's food disposal could improve the accuracy of their estimates. On the other hand, it could also mean their existing food waste behaviours are influenced positively as they are now more aware of their waste.

- b. Having a control group is important for validity because it allows comparison of results between the control and intervention groups. This improves the validity of measurements of an intervention's impact.
- c. Trialling different intervention durations can detect significant behaviour change and is important for examining the long-term effects of interventions.

Recommendation 10: Use the 'Household Food Waste Reduction Toolkit' to guide the interventions.

The *Household food waste reduction toolkit: A step-by-step guide to designing interventions in Australia* developed by the Fight Food Waste Cooperative Research Centre provides research-based guidance to organisations and individuals focused on developing strategies and implementing interventions to reduce household food waste in Australia (Karunasena & Pearson, 2023). The toolkit can be downloaded at: <https://fightfoodwastecrc.com.au/wp-content/uploads/2023/03/Practitioners-Toolkit-Final.pdf>.

Figure 1 provides a summary of the steps identified in the toolkit.

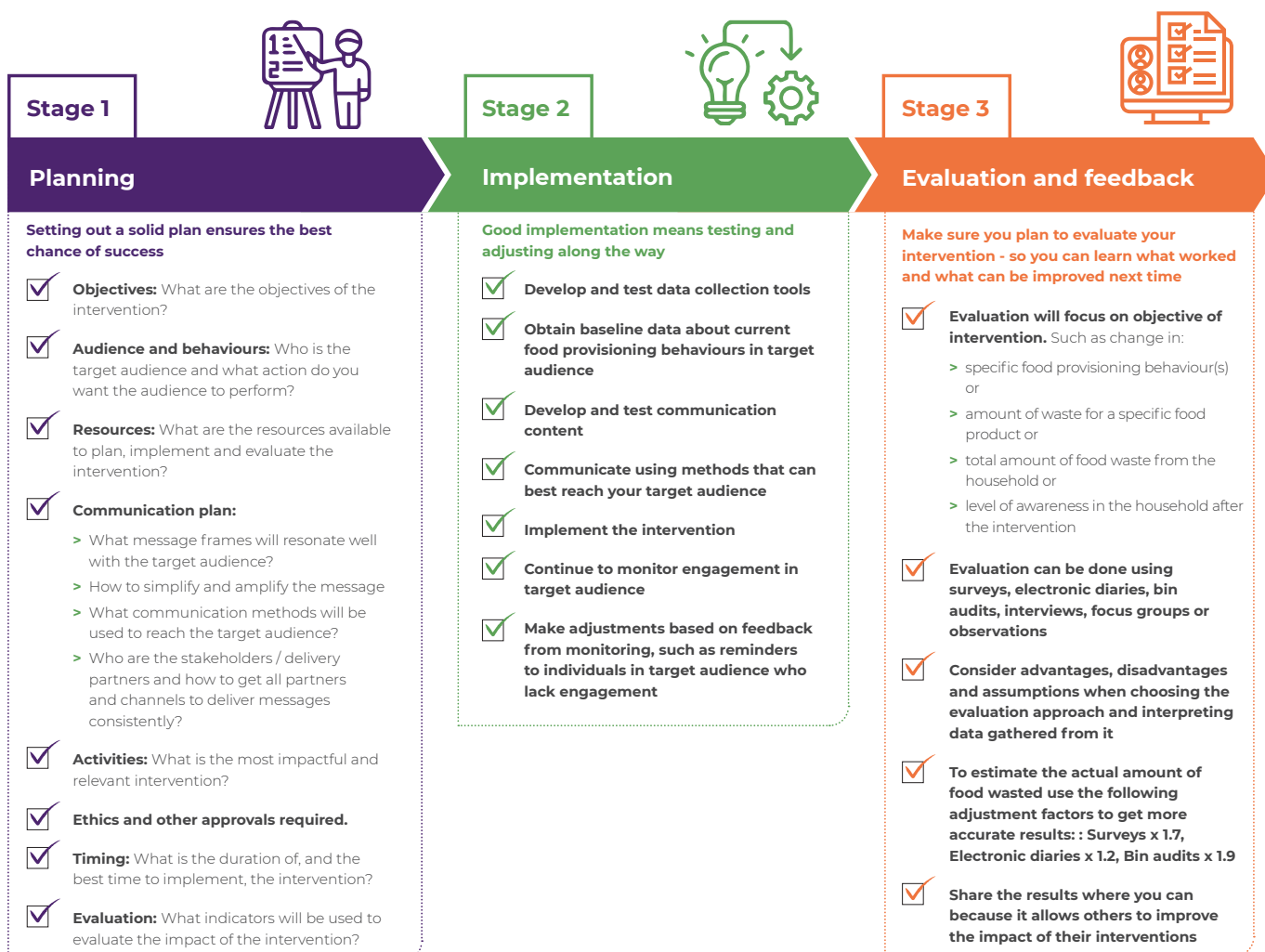


Figure 1: A summary of the *Household food waste reduction toolkit: A step-by-step guide to designing interventions in Australia*



Introduction

Food waste costs the national economy \$36 billion annually and households contribute more than half of this value of waste.

According to the *National Food Waste Strategy Feasibility Study 2021*, at least a 30% reduction in household food waste is required if Australia is to meet the National Food Waste Strategy target of halving Australia's food waste by 2030 (Food Innovation Australia Limited, 2021).

Interventions such as information sharing, role-modelling, public commitments, goal-setting, negative or positive reinforcement etc. can be used on their own or in combination in campaigns to reduce household food waste. However, not many of these interventions or campaigns are designed to include an underlying robust evaluation that would help practitioners determine the effectiveness of those interventions in reducing food waste and/or changing food waste related behaviours (Cooper et al., 2023; Karunasena et al., 2020). As such, the

Evaluating the impact of priority household food waste reduction interventions project; the Evaluation of Interventions project aimed to evaluate the effectiveness of several household food waste reduction interventions for their ability to reduce waste, generate awareness and change behaviours. Findings from this project will inform interventions developed in Australia by governments, businesses, industry and non-government organisations to address the consumer behaviour change needed to reduce household food waste across Australia.

This report presents two case studies of interventions seeking to reduce household food waste in Australia, one implemented by Inner West Council (IWC) and the other by Eat Well Tasmania (EWT). Each case study includes subsections covering design, implementation and results.

When working with these organisations, we focused on encouraging the following priority behaviours recommended by the Fight Food Waste Cooperative Research Centre (CRC) (Ananda et al., 2021; Karunasena & Pearson, 2022) because these have the highest impact on reducing food waste.

Priority behaviours to focus on for development of household food waste interventions

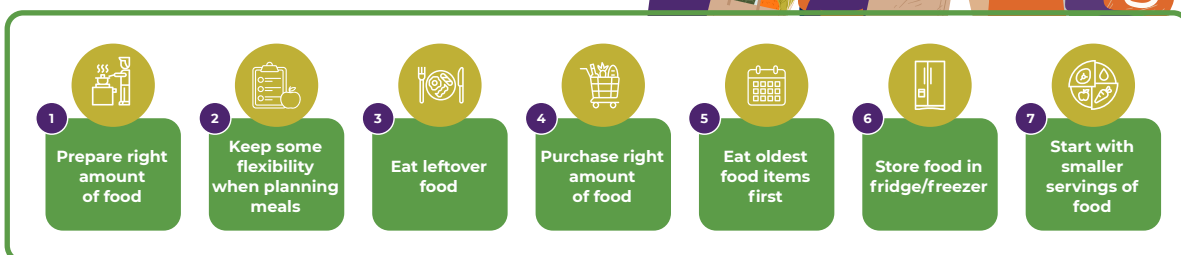


Figure 2: Priority behaviours for reducing household food waste (Ananda et al., 2021)

Food categories to be prioritised

(top 5 out of 13 based on \$ value)



Figure 3: Food categories to be prioritised for household food waste interventions

Products to be prioritised

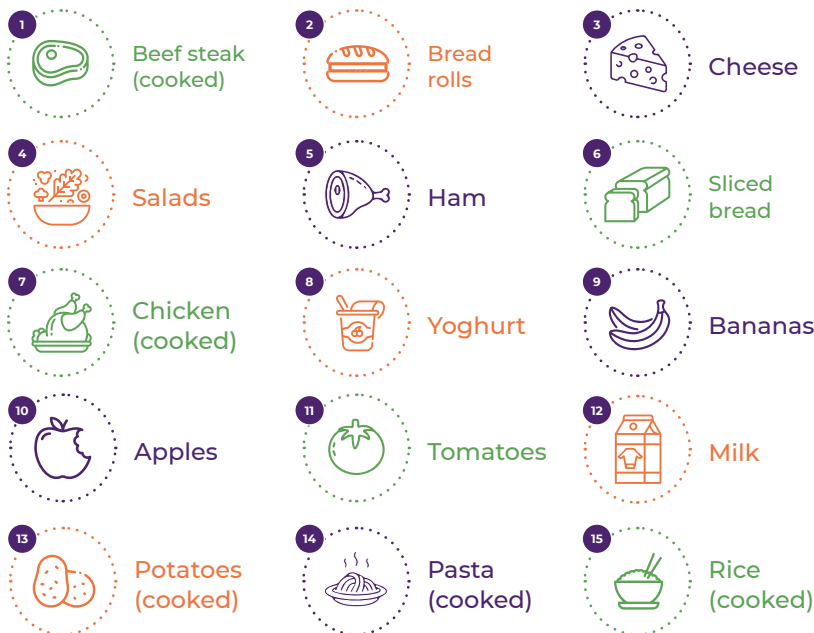


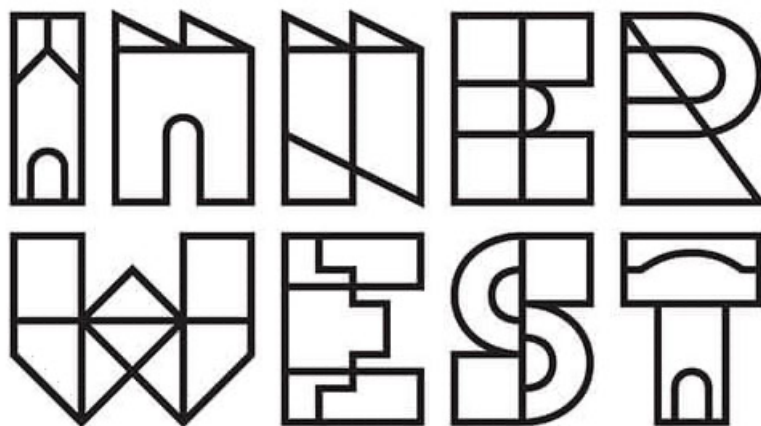
Figure 4: Priority products for household food waste interventions

Where possible, the interventions also focused on the following most commonly wasted food categories and products in Australia (Ananda et al., 2021; Karunasena & Pearson, 2022).

The two interventions targeted food managers (consumers who are mainly or equally responsible for food provisioning behaviours such as planning, shopping, storing, cooking and disposal in their households) aged between 18-35. The reasons for this were: (1) prior studies have shown that younger generations lack food-management skills when compared to older generations (Karunasena et al., 2021); and (2) younger age groups offer a longer proportion of their life cycle in which to adopt these behaviours and pass them on to the next generation.

Both interventions were evaluated using online surveys. Development of these surveys was guided by the Motivation, Opportunity and Ability (MOA) framework (van Geffen et al., 2020). Firstly, a pre-intervention survey was sent to identify the baseline behaviours and food waste of the target audience. Post-intervention Survey One was sent out two weeks after completion of the intervention. This aimed to assess changes in behaviours and food waste as soon as possible after completion of the intervention. Post-intervention Survey Two was sent out four weeks after completion of the intervention to assess how enduring behaviour change was and to estimate the reductions in food waste resulting from the intervention.

Case 1: Inner West Council - Sydney



IWC Interventions

- > Three face-to-face workshops
- > Food waste reduction tips sent through email newsletters
- > Free online short courses on reducing household food waste

Target Behaviours

- > Meal planning
- > Using/eating leftovers
- > Storing food correctly

Target Audience

- > Younger households (18-35 years)



1.1 About the organisation

IWC is one of the older areas of Sydney. It provides services to approximately 186,000 residents and has an area of 36 square kilometres between Balmain in the North, Newtown in the East, Tempe in the South and Croydon in the West. It includes the following Sydney suburbs – Annandale, Ashfield, Balmain (including Balmain East), Birchgrove, Dobroyd Point, Dulwich Hill, Enmore, Haberfield, Leichhardt, Lewisham, Lilyfield, Marrickville, Petersham, Rozelle, Stanmore, St Peters, Summer Hill, Sydenham, Tempe and parts of Ashbury, Camperdown, Croydon, Croydon Park, Hurlstone Park and Newtown.

IWC residents tend to be young, with the majority between the ages of 25 and 60. The area is ethnically diverse, with 30% of the population speaking a language other than English. It is also creative, with double the Greater Sydney average of people working in the arts.

1.2 Promotion and recruitment for the interventions

The intervention focused on educating IWC residents to reduce their in-home food waste through meal planning, storing food correctly, and cooking with leftovers. The IWC reached out to the target audience through Facebook and Instagram to complete a pre-intervention survey and register for the workshops.

They also used local special events like farmers' markets to recruit participants. Participants were encouraged to fill in three surveys (a pre-intervention survey and two post-intervention surveys) by offering prizes from a raffle draw, such as \$240 Providore vouchers, \$240 cheese platters, recipe books and \$240 supermarket gift vouchers. Those participants who registered, regardless of whether they attended a workshop, were sent weekly emails with food waste reduction tips.

The link to the Pre-intervention Survey was shared on the IWC Facebook and Instagram pages three weeks before Workshop One. The survey itself was developed on the Qualtrics web platform and managed by the Central Queensland University research team. Post-intervention Survey One was sent out two weeks after completion of Workshop Two to those who had registered for the Pre-intervention Survey. Post-intervention Survey Two was sent out four weeks after completion of Workshop Three. Both post-intervention surveys were sent to all those who filled in the Pre-intervention Survey.

IWC recruited participants to fill in the Pre-intervention Survey by sharing the following posts on their website, Facebook and Instagram pages.

Channel:	IWC Facebook
Release date:	04/08/2022
Total post reach (number of times people saw the post):	4235
Total engagement (commented, shared, clicked):	132
Link clicks:	65

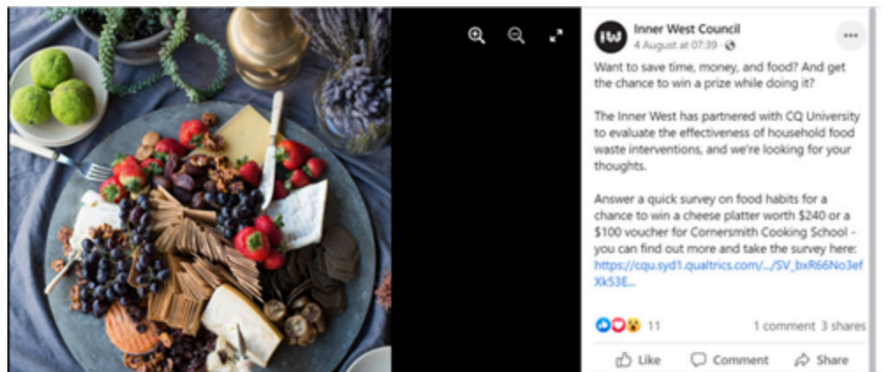


Figure 5: A Facebook post inviting people to participate in the Pre-intervention Survey

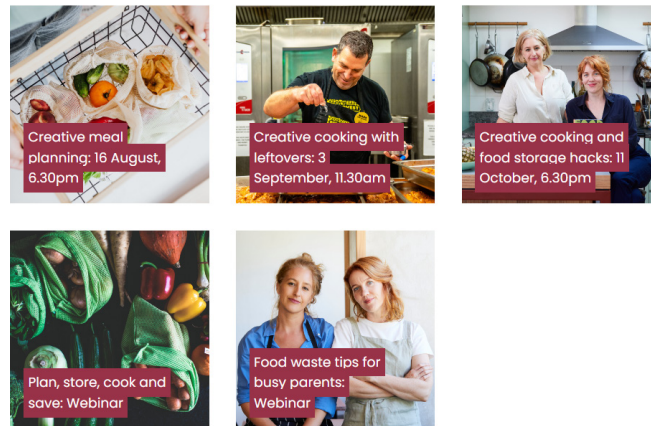
Further, IWC and their intervention delivery partners separately shared Facebook and Instagram posts about events to recruit participants for the events. These included both paid and unpaid advertising. These workshops were also featured in the 40,000 newsletters that were printed and distributed to dwellings in the IWC area.

Appendix 1 provides the tracking information on the communications put out by the IWC and its partners.



Figure 6: A post on the IWC Facebook page about Workshop One

Workshops and training



There are other fantastic ongoing programs such as [Food Smart](#), with tips and information to help you save food and money.

Figure 8: IWC website inviting people to fill in the Pre-intervention Survey and attend workshops

Avoiding Food Waste

Win prizes, learn how to save money, time and food

We have launched the inner West Supper Club. A four-month journey exploring creative ways of cooking, preserving and planning for delicious meals with the aim of reducing food waste.

We will be giving away prizes such as a cheese platter, vouchers for cooking classes, free dinners and more!

[Get involved now](#)

Food waste makes up to 37% of the average garbage bin in the Council area. Reducing food waste is a priority to the Council as it's key to moving towards zero waste.

Food waste costs Australian households **\$2,000 - \$2,500 per year**.

Some of the reasons why food is wasted are:

- Cooking and buying too much
- Mistakenly discarding food before the use-by/best before date
- Changing plans last minute to eat out or buy takeaway meals

Wasting food also wastes the energy, water and natural resources used to grow, package, transport and market that food.

Here are some key recommendations to avoiding food waste to help you decrease your footprint and save money.

On this page

- [Become a zero foodwaste hero](#)
- [Workshops and training](#)
- [Unavoidable food waste](#)

Related news [View all news](#)

- Henson Park to star in AFLW 2022 season >
- Yirran Gumar rated EXCEEDING the National Quality Standards >
- Balmain Town Hall Precinct to be revitalised >

Figure 7: IWC website inviting people to fill in the Pre-intervention Survey and attend workshops

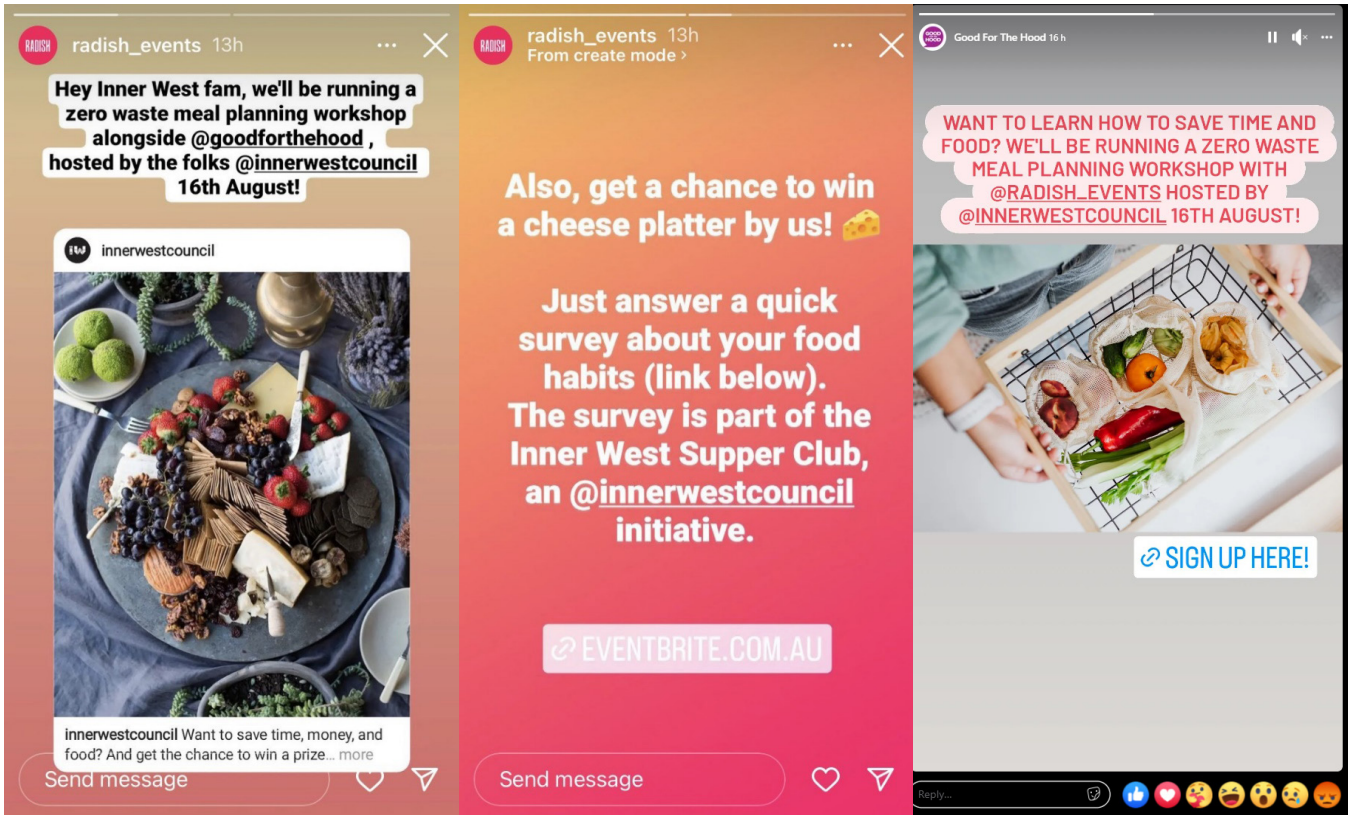


Figure 9: Social media stories shared by partners of the intervention, 'Good for the Hood' and 'Radish Events'



1.3 Implementation

1.3.1 Workshop One

This workshop focused on teaching participants how to plan meals. They were also taught in a few simple steps how to create 'the ultimate leftover minestrone', which was then served for everyone to taste. Thirty attendees participated in the workshop.

The workshop took the form of a chat between Jo Taranto from Good for the Hood and Henri Turra from Radish Events. Jo shared evidence-based food waste information and tips for effective meal planning. Based on his catering experience, Henri guided participants on how to effectively plan meals and demonstrated how to make a zero-waste minestrone. Participants were encouraged to ask questions. Information on how Jo and Henri plan their meals at home was also shared with participants.

The zero-waste minestrone was served with focaccia during the presentation. At the end of the workshop, all the leftover soup was put into reused glass jars for participants to take away. Stainless steel takeaway containers were also given to five lucky winners who participated in the workshop. The minestrone recipe was sent to participants' email addresses at the end of the workshop.

1.3.2 Workshop Two

This workshop focused on teaching participants how to reduce their food waste by improving their buying and storing behaviours. It was facilitated by OzHarvest and run during the Footprints Festival in September 2022. People drifted in and out during the presentation, but there were at least 30 in attendance.

A chef from OzHarvest demonstrated how to make a risotto with leftover vegetables and talked through alternatives that could be used in place of the ingredients he had on hand. General food waste minimisation tips around buying and storing food were also discussed. The audience was very engaged, with lots of questions asked, mostly about cooking techniques. Dinner vouchers for a meal at The Refettorio OzHarvest Sydney restaurant were given to two attendees selected in a draw after the event.

1.3.3 Workshop Three

Workshop Three focused on using leftovers and storing food correctly to keep it fresh for longer. This workshop was delivered by James and Alex from Cornersmith Cooking School. The workshop started with a dinner prepared from leftover ingredients and followed by preparing the recipes for the dishes served. Tips on storing herbs and leaf vegetables to keep them fresh for longer were shared during the workshop. The presenters also made a stock from usually discarded food items like outer leaves and stalks of different vegetables and herbs. Participants then got hands-on experience pickling vegetables. Each participant was given the ingredients and utensils needed to make their own bottle of pickled onions, which they got to take home. At the end of the event, copies of the recipe book *Cornersmith Use It All* were also given away to winners from a draw.

1.3.4 Weekly emails with food waste reduction tips

Three emails which included food waste reduction tips were sent to all participants who registered to fill in the Pre-intervention Survey. It was noticed that newsletter-type, well-designed emails elicited a better response than emails with text only.



Figure 10: Participants at Workshop Three learning and getting hands-on experience pickling vegetables



Figure 11: Participants serving themselves meals prepared with leftover ingredients



Figure 12: Food waste reduction tips included in email communications

Hot tip to reduce food waste (and save time)!



Photo from [OzHarvest](#)

Have a "Use it up" section in your fridge or pantry to store older food items or leftovers.

Figure 13: Food waste reduction tips included in email communications

Hot tip to reduce food waste (and avoid wasting money)!

Invited to go out to dinner last-minute? Keep a stash of re-usable air-tight containers to store uneaten meals.



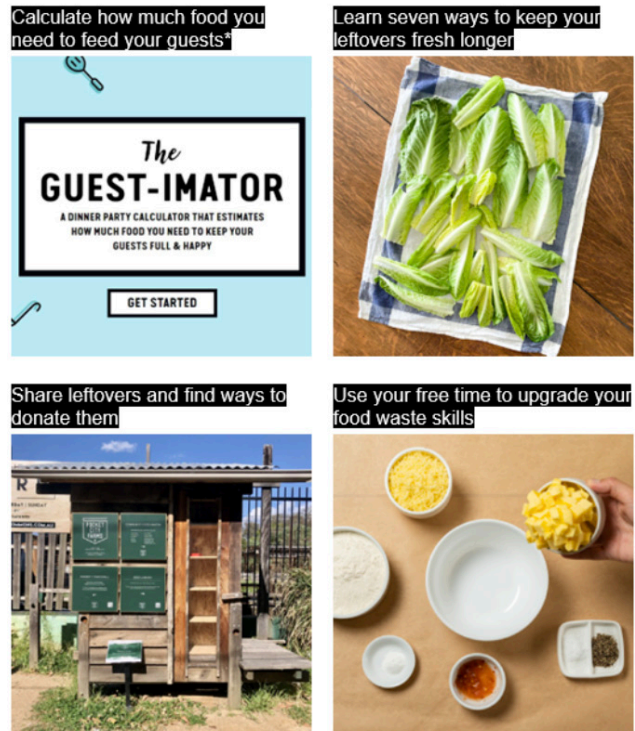
Figure 14: Food waste reduction tips included in email communications



Figure 15: Food waste reduction tips included in email communications

Four tips to avoid festive food waste

Did you know that food waste increases by 30% during the holiday season? Last-minute plans, unplanned meals and overbuying are some reasons food is wasted. Follow the tips below to save time, food and money!



*Please note that the Guest-Imator website estimates portions in pounds and ounces.

Figure 16: Food waste reduction tips included in email communications

1.3.5 Food waste reduction online course

Cornersmith Cooking School developed a free online course that provided useful tips on various food waste reduction behaviours and recipes. The recipes focus on using one main ingredient to make different meals. Further information on Cornersmith Cooking School can be accessed at [Love Food Hate Waste x Cornersmith](#). This course was offered to all participants, however, only 13 consumers completed the online course.

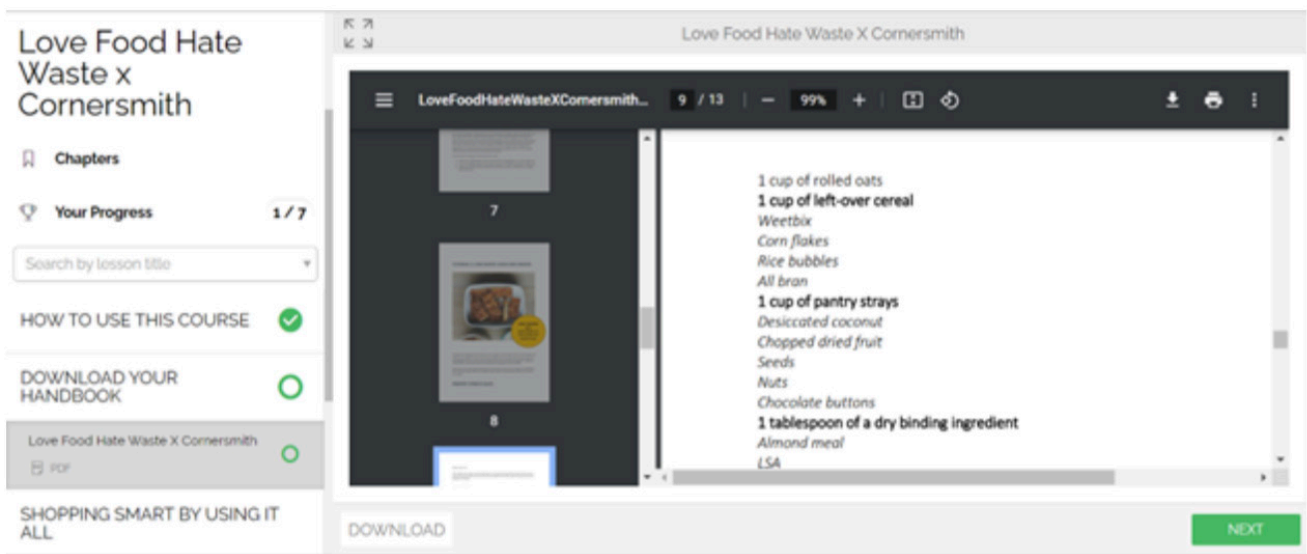


Figure 17: Love Food Hate Waste x Cornersmith online course user interface

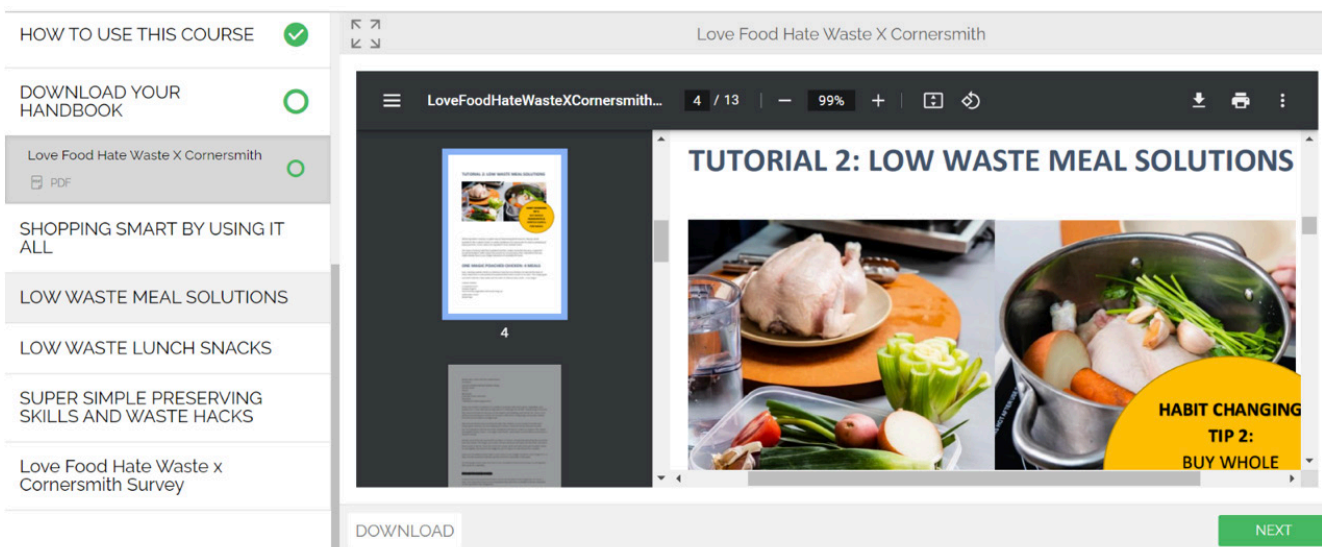


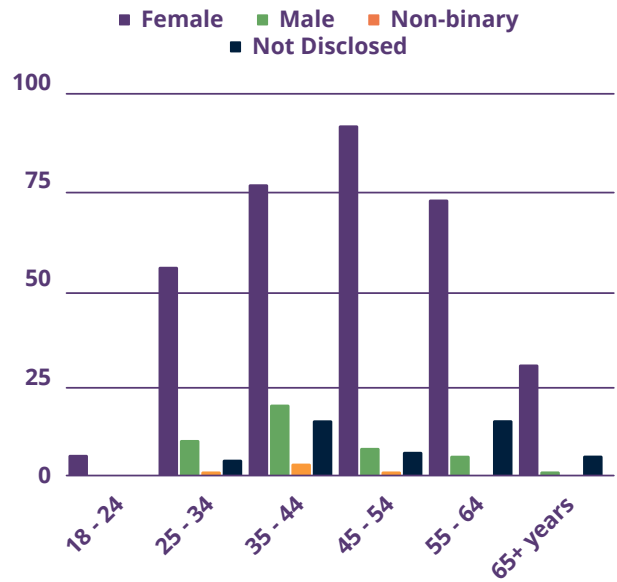
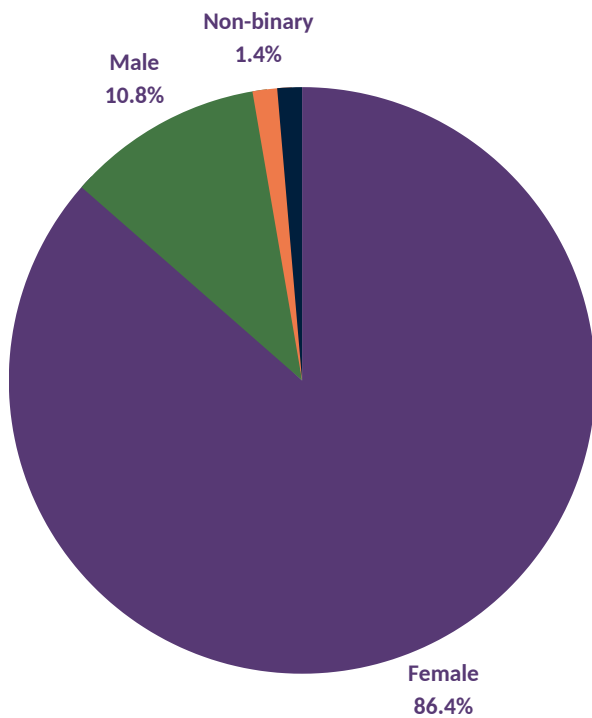
Figure 18: Love Food Hate Waste x Cornersmith online course user interface

1.4 Results of the evaluation

1.4.1 Participant engagement with intervention activities

The Pre-intervention Survey (Appendix 2) was completed by 451 participants. Most participants (86.4%) were female and middle to older aged. The biggest age group was 45-54 years. Participation of 18-35 years group was relatively low (18% of the total sample). The participant profile is shown in Figure 19 below.

Pre-Campaign Demographics



The majority of participants belongs to older age groups



Over 85% of participants were female

Figure 19: Sample profile of Pre-intervention Survey respondents – IWC food waste intervention

Post-intervention Survey One was completed by 151 participants, 142 of whom had also completed the Pre-intervention Survey and were thus used for the analysis. Post-intervention Survey Two had 68 matching participants who had filled in the first two surveys. Interventions participation is summarised in Figure 20. The majority took part in the information intervention through email newsletters (45.8%), with 11.3% attending workshops and receiving email newsletters, and 10.6% only attending workshops.

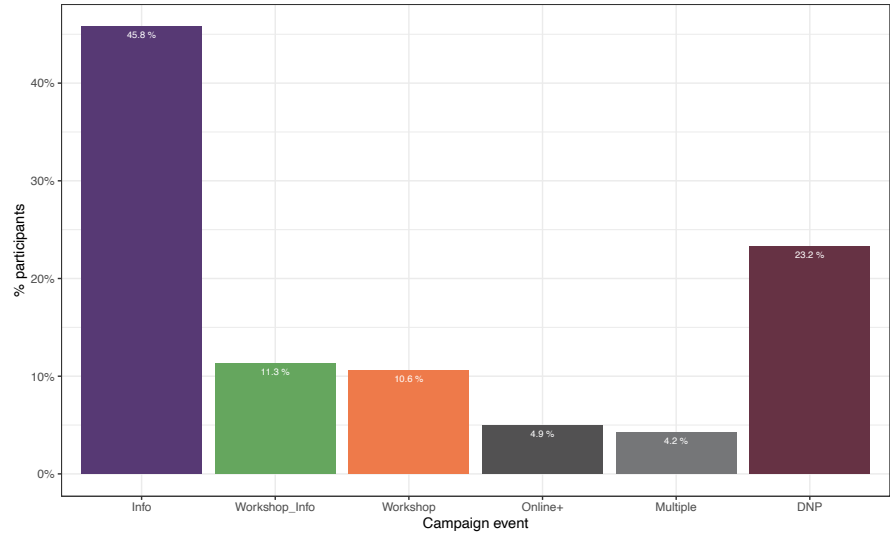
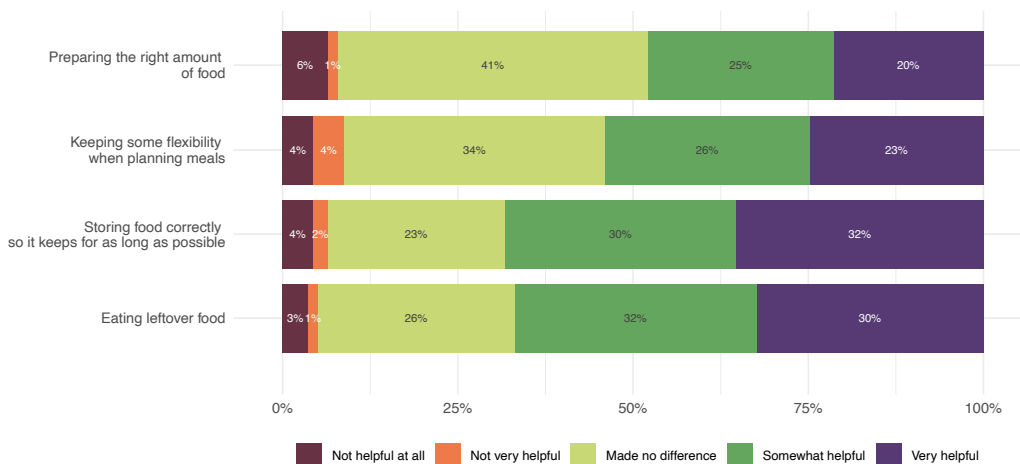


Figure 20: Interventions participation rates (based on Post-intervention Survey One N=142).

1.4.2 Perceptions of the effectiveness of the interventions

Participants rated the effectiveness of four aspects of the IWC food waste interventions – (1) preparing the right amount of food, (2) keeping some flexibility when preparing meals, (3) storing food correctly so it keeps for as long as possible, and (4) eating leftover food. Figure 21 summarises the sample ratings based on a five-point Likert scale ranging from Very helpful to Not helpful at all. Sixty-two per cent of participants rated the interventions coverage of correct food storage and eating leftover food as either Very helpful or Somewhat helpful. On the one hand, these two behaviours are easy to adopt as they require less effort by consumers. On the other hand, the

presentation of these behaviours in the intervention was more attractive and engaging. The interventions had less impact on helping participants prepare the right amount of food and maintaining flexibility when planning meals. Almost half of the sample (48%) stated that interventions Did not make a difference or was Not at all helpful for preparing the right amount of food. Forty-two per cent of households said that the meal planning flexibility aspect of the intervention either Did not make a difference or was Not at all helpful. This is not surprising given that both aspects demand more effort from participants to change complex behaviours in their daily routines.



Key: The percentages on the horizontal bars indicate the proportion of the sample providing the rating.

Figure 21: Participant perceptions of the effectiveness of interventions.

1.4.3 Behaviour changes reported between the Pre-intervention Survey and Post-intervention Survey Two

Behaviour changes across four food management areas were reported through pre-intervention and post-intervention surveys and the responses analysed. Positive changes in all aspects were observed, although none showed a statistically significant behaviour change. Behaviour change comparisons are shown in Appendix 3.

- > The proportion of households claiming to use the oldest food first, Almost every time increased from 23% in the Pre-intervention Survey to 44% in Post-intervention Survey Two.
- > The proportion of the sample claiming to eat leftover food, Almost every time increased from 46% in the Pre-intervention Survey to 50% in Post-intervention Survey Two.
- > The portion of the sample who Rarely or Never considered eating out or meal delivery days when meal planning, reduced from 31% in the Pre-intervention Survey to 23% in Post-intervention Survey Two.
- > The proportion of the sample who Rarely or Never designated 'use me first' areas or containers for food storage reduced by 17% between the Pre-intervention Survey and Post-intervention Survey Two.

1.4.4 Changes to household food waste

The preceding section focused on the behaviour change impact of the interventions, while this section analyses the impact of interventions in terms of reductions in the amounts of food waste at household level. The IWC food waste interventions did make an impact on the household food waste of participants. The impact was analysed using two approaches: the proportion of participants who reduced their food waste and changes to the amount of food waste. First, the proportion of the sample that managed to reduce food waste was examined. Figure 22 summarises the changes in food waste by study participants and the control group (those who did not take part in any intervention). Changes to food waste amount are discussed in section 1.5.5.

Many (45%) of the participants who took part in any intervention (intervention group) reported a reduction in food waste. This was 22% more than the control group who reported a reduction. The reduction in food waste by the control sample could have been due to inevitable fluctuations in the amount of food wasted in households, measurement errors, awareness generated by the completion of the three surveys, or possible exposure to other food waste reduction messages. The proportion of participants who reduced food waste was significantly greater in the intervention group than in the control group (Chi-squared = 3.22, p-value = 0.036).

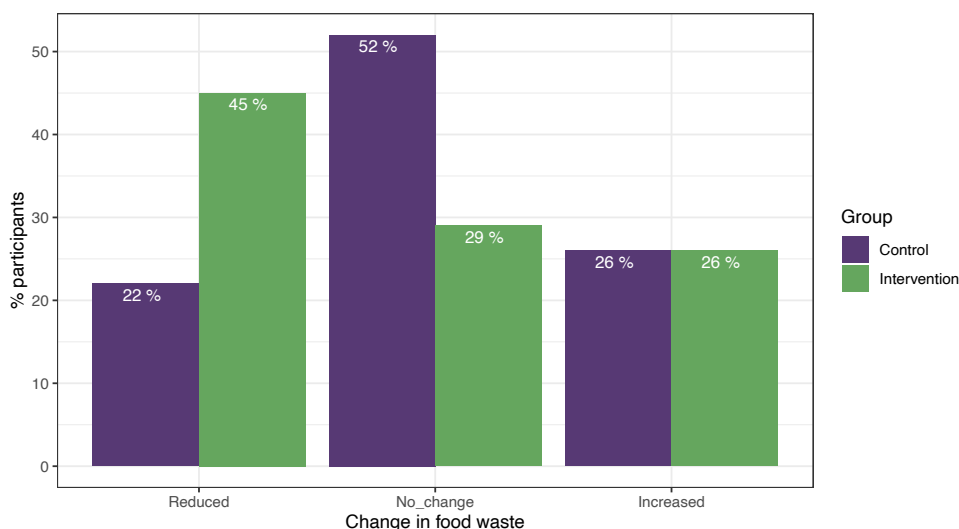
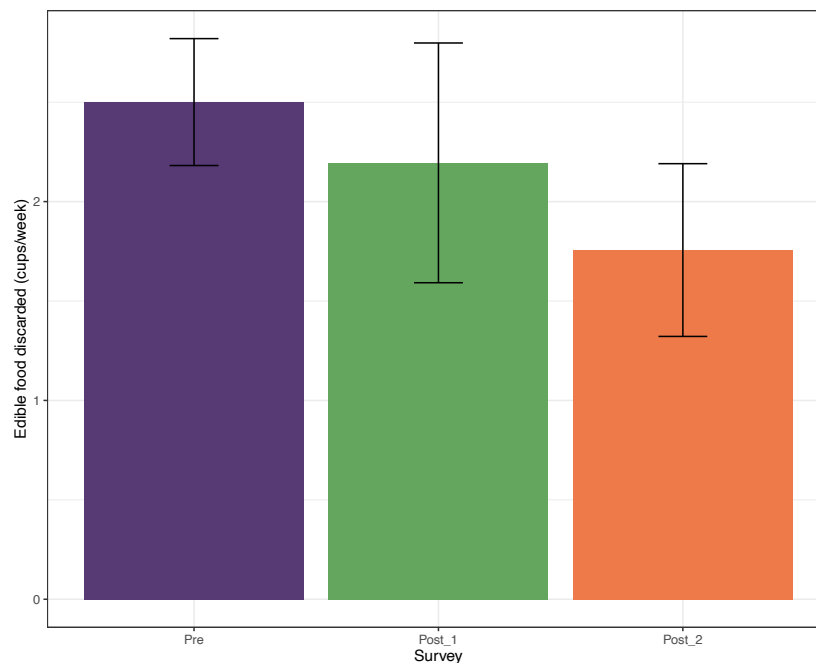


Figure 22: Household food waste impacts reported by the intervention and control groups based on a matched sample of Pre-intervention Survey respondents and Post-intervention Survey One respondents (n = 100)

1.4.5 Changes to the amount of food wasted

The IWC food waste interventions appeared to help participants to reduce the amount of food wasted at home. Figure 23 shows average food waste figures as reported in the three surveys. The average weekly household food waste reported in the Pre-intervention Survey was 2.5 cups (standard deviation = 3.20), in Post-intervention Survey One it was 2.19 cups (standard deviation = 3.66), and in Post-intervention

Survey Two it was 1.76 cups (standard deviation = 1.74). Thus, on average, participants reduced their food waste by 12% between the Pre-intervention Survey and Post-intervention Survey Two. The food waste average reported in Post-intervention Survey Two represents a 30% reduction from the baseline average. However, these average food waste changes across the three surveys were not statistically significant, with a 5% confidence level (Chi-squared = 4.04; $p = 0.132$).



Key: Pre = Pre-intervention Survey (n = 406); Post_1 = Post-intervention Survey One (n = 151); Post_2 = Post-intervention Survey Two (n = 68).

Figure 23: Average edible food waste (cups/week/household) reported in the three surveys

Table 1 summarises the food waste changes of all participants (intervention group and control group) by intervention event. Due to the low numbers of respondents to Post-intervention Survey Two, the baseline food waste values identified in the pre-intervention survey were compared with Post-intervention Survey One using a matched sample of the same participants in both surveys. Table 1 shows that the non-participants (the control group) recorded a 4% reduction while intervention participants (the intervention group) recorded greater

food waste reductions. It is notable that workshop participants recorded the greatest food waste reduction (31%), while multiple-event participants and those who engaged in both workshops and the email intervention reported on average 16% and 15% food waste reductions, respectively. The email intervention was the least effective intervention in terms of food waste reduction.

Table 1: Effects of the IWC food waste interventions

Group	Intervention	Count	Pre intervention Survey (Pre)		Post-intervention Survey One (Post_1)		Change	
			Mean	SD	Mean	SD	No. of cups	%
Intervention Group	Workshop(s)	10 (10%)	2.17	2.21	1.50	1.73	-0.67	-31
	Multiple events	10 (10%)	1.80	1.25	1.52	1.33	-0.28	-16
	Workshop+Info	15 (15%)	1.68	1.47	1.42	1.50	-0.26	-15
	Email Information	42 (42%)	3.10	6.28	2.90	6.16	-0.20	-6
Control Group	-	23 (23%)	2.01	1.49	1.93	1.72	-0.08	-4%

Key: Based on a matched sample of the Pre-intervention Survey and Post-intervention Survey One. SD = Standard Deviation.

Case 2: Eat Well Tasmania



Too Good to Waste

EWT Interventions

- > Three 10-minute videos shared on social media

Target Behaviours

- > Eating oldest food first
- > Eating/using leftovers
- > Storing food correctly

Target Audience

- > Younger households (18-35 years)



2.1 About the organisation

EWT is a not-for-profit organisation that engages with food, agriculture and allied industries to champion Tasmanian food and promote the healthy and sustainable consumption of Tasmanian produce by Tasmanians.

With their partners across the Tasmanian food system, EWT works to cultivate opportunities for Tasmanians to enjoy equitable and easy access to more seasonally grown and valued-added food, as well as to bolster and support the growth of food literacy amongst the Tasmanian population. The EWT team achieve this through research, strategic storytelling, awareness campaigns and advocacy.

2.2 Intervention

On International Day of Food Waste and Loss Awareness (29 September 2022), EWT launched *Too Good To Waste*, a new intervention to help Tasmanians reduce their food waste and eat well. *Too Good To Waste* was funded by the City of Hobart Urban Sustainability Grants and, the TasNetworks Sustainable Futures Grants Program and supported by Healthy Tasmania.

In *Too Good To Waste*, EWT explores the connections between chefs and producers. Their stories show that reconnecting with food systems and cultivating relationships with local food producers is a good way to start tackling the culture of food waste. The intervention uses strategic storytelling and visual media to create a video series made available on social media. The content comprises three short episodes and a short documentary also titled '*Too Good To Waste*'. The videos emphasise the resources – like water, fuel, labour, money and time – that go into producing the food that households waste. They emphasise the efforts of Tasmanian farmers and aim at instilling in viewers an emotional connection with the origins of the food they eat or waste. The documentary chronicles the journey of Tasmanian food from paddock to plate and profiles the producers, chefs and educators who make this possible.

Too Good to Waste features Tasmanians who live and breathe Tasmanian food and who are leaders in living a low-waste life. These people are known as campaign champions. These champions work across the food system, from food production and hospitality through to food education, to advocate for reducing avoidable food waste. The champions use their platforms and influence to promote content and key messages. The intervention champions are:

- > **Stan Robert** and **Briony Patterson**: Producers at Fat Carrot Farm
- > **Tony Scherer**: Founder and Producer at Rocky Top Farm
- > **Luke Burgess**: Tasmanian Chef
- > **Tom Westcott**: Co-owner and Executive Chef at Tom McHugo's
- > **Ainstie Wagner**: Executive Chef at Government House Tasmania
- > **Kirsten Bacon**: Chef and Food Educator

The *Too Good To Waste* intervention focused on encouraging viewers to eat the oldest food items first, cook with leftover ingredients, and store food correctly and creatively to extend its life. The three short videos introduced viewers to new food preparation methods like preserving, dehydrating, and using cultures to help reduce avoidable food waste in the home. The intervention focused on working with the most often wasted products in households, such as bread, milk, vegetables, salad leaves, herbs and meat.

Too Good To Waste Episode 1 discusses how to plan your weekly meals, cook, and store your food correctly. The full episode is available at: www.youtube.com/watch?v=LoE_4qGFIWc

Too Good To Waste Episode 2 looks at coming up with meals using uncooked (e.g. raw vegetables) and cooked (e.g. cooked chicken) leftovers. This episode explains how to rescue wilted salad leaves, stale bread and cooked chicken. The full episode is available at: www.youtube.com/watch?v=wUgDYWfqbZA

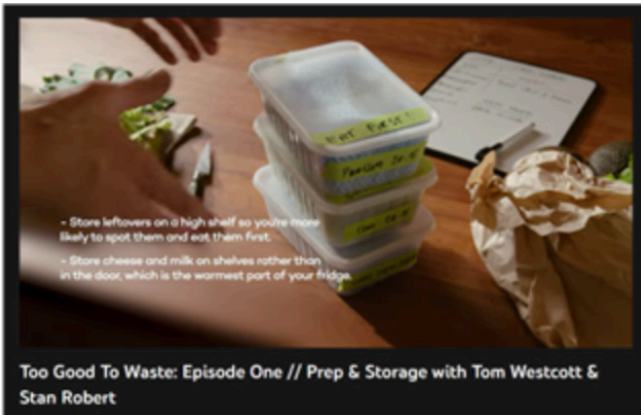
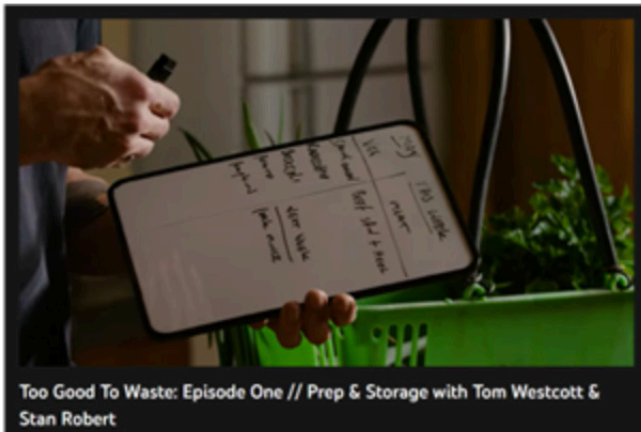


Figure 24: Screenshots from Episode 1 of *Too Good to Waste*

Figure 25: Screenshots from Episode 2 of *Too Good to Waste*

Too Good To Waste Episode 3 focused on cooking with produce past its prime, educating viewers on how to pickle their vegetables using hot or cold brines, repurpose old milk and dehydrate fruits, vegetables and herbs. The full episode is available at: <https://www.youtube.com/watch?v=iWBxM4ayutA&t=5s>



Figure 26: Screenshots from Episode 3 of *Too Good to Waste*

YouTube and Instagram were used to circulate the videos to the target audience. Posts focused on content such as the following:

'Wasting food wastes everything: Water, fuel, labour, money and time. Tasmanian producers work hard so we can eat incredible food – it belongs on our plates, not the bin. 'Too Good To Waste', a short film, chronicles the journey Tasmanian food makes from paddock to plate and the incredible producers, chefs and educators that make this possible'.

2.3 Promotion and recruitment

The recruitment process for this intervention was carried out by EMRS a Tasmania-based research company. Individuals who had already registered with this company were sent several emails inviting them and reminding them (Figure 27) to take part in this intervention (see Appendix 4 for other invitations).

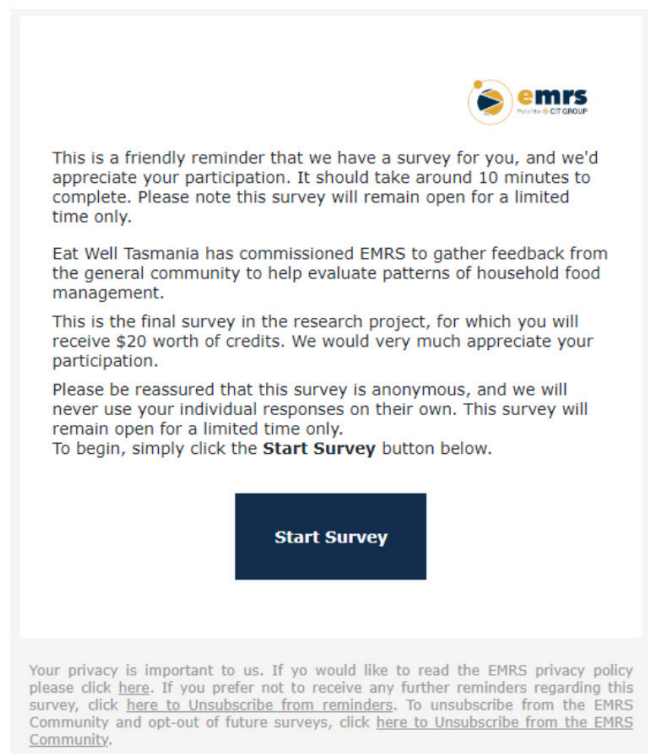


Figure 27: A reminder to take part in the EWT survey

2.4 Results of the evaluation

2.4.1 Participants' engagement with the intervention

The Pre-intervention Survey was completed by 305 households and the self-reported food waste behaviours reported in the survey were considered as the baseline. Two weeks after the end of the intervention, Post-intervention Survey One was completed by 179 households (Appendix 5). One hundred and fifty-seven (157) households completed Post-intervention Survey Two that was sent out four weeks after the end of the intervention. Engagement with the intervention was high, with 44% of the pre-intervention respondent households completing all three surveys for a matched sample (n = 155).

2.4.2 Participant profile

Most participants (73%) in the Pre-intervention Survey sample were female. The age distribution was slightly skewed towards older consumers (55+ years), with quite low youth participation (18-24 years). Figure 28 shows the socio-demographic profile of the pre-intervention sample, including distribution by age and gender.

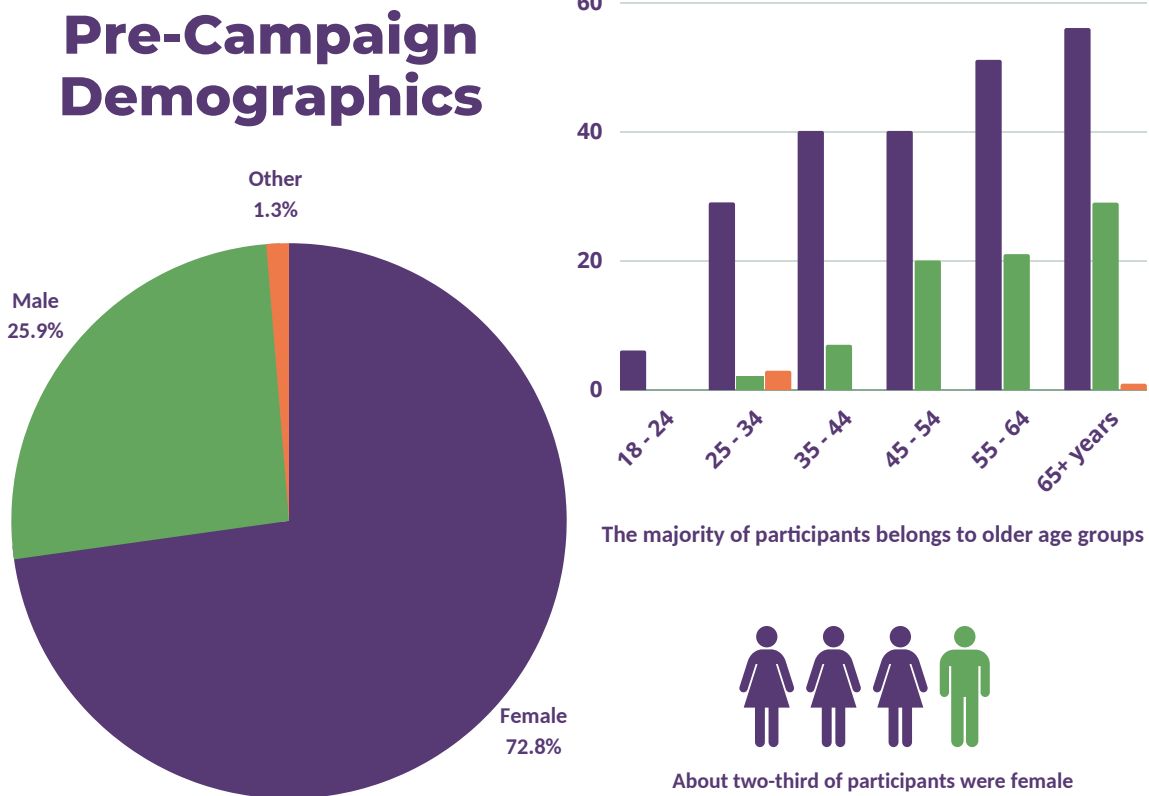


Figure 28: Sample profile of Pre-intervention Survey respondents of the EWT food waste intervention

Figure 29 shows the household income distribution in the pre-intervention sample. Most participants of the Pre-intervention Survey belonged to low or middle-income groups. For example, of the total sample, 35% and 32% of households had weekly household incomes of \$1000-\$1999 and <\$999, respectively.

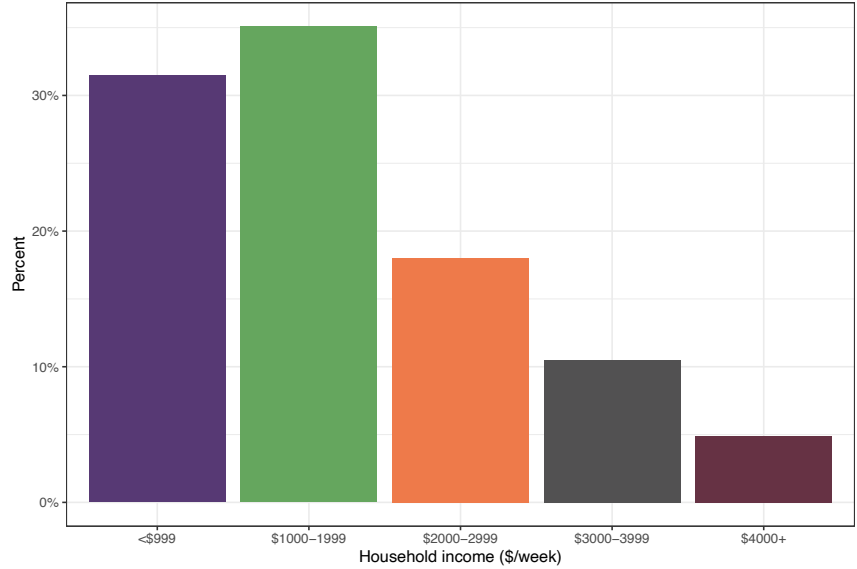


Figure 29: Income distribution of the pre- intervention sample for EWT food waste intervention

2.4.3 Perceived effectiveness of the intervention

Participants were asked how helpful the information provided in the intervention was in reducing food waste in their households. Figure 30 summarises ratings which participants provided for each aspect of the EWT food waste reduction intervention, as reported in Post-intervention Survey Two.

As shown in Figure 30, the materials on leftover food management (cooking and eating old food past its prime), learning new skills to cook food, and appropriately storing food were rated highly. For instance, 77% of participants rated learning and using new cooking skills from the intervention as either *Very helpful* or *Somewhat helpful*, while 76% of participants rated the leftover food management material as either *Very helpful* or *Somewhat helpful*.

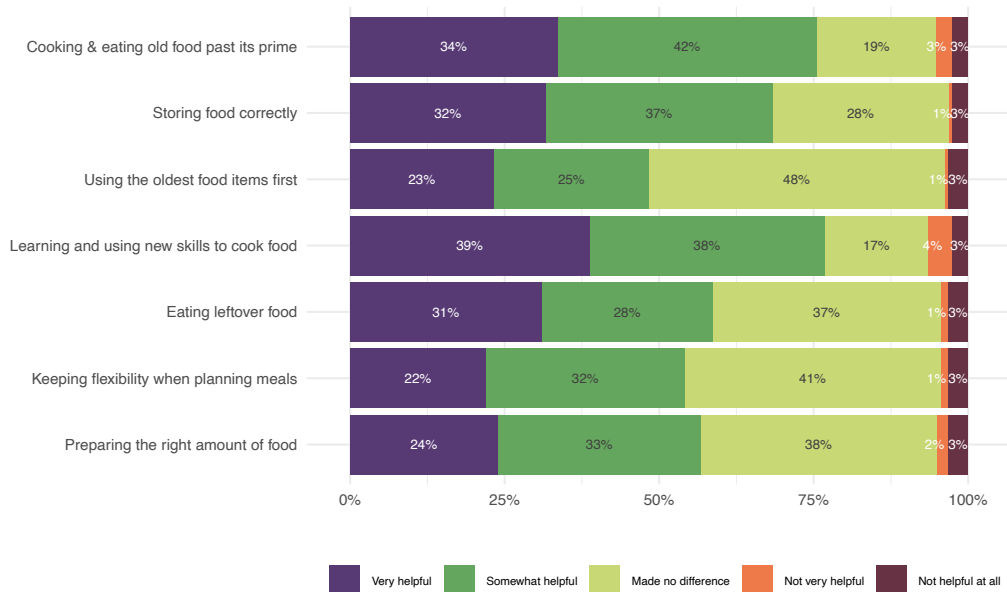
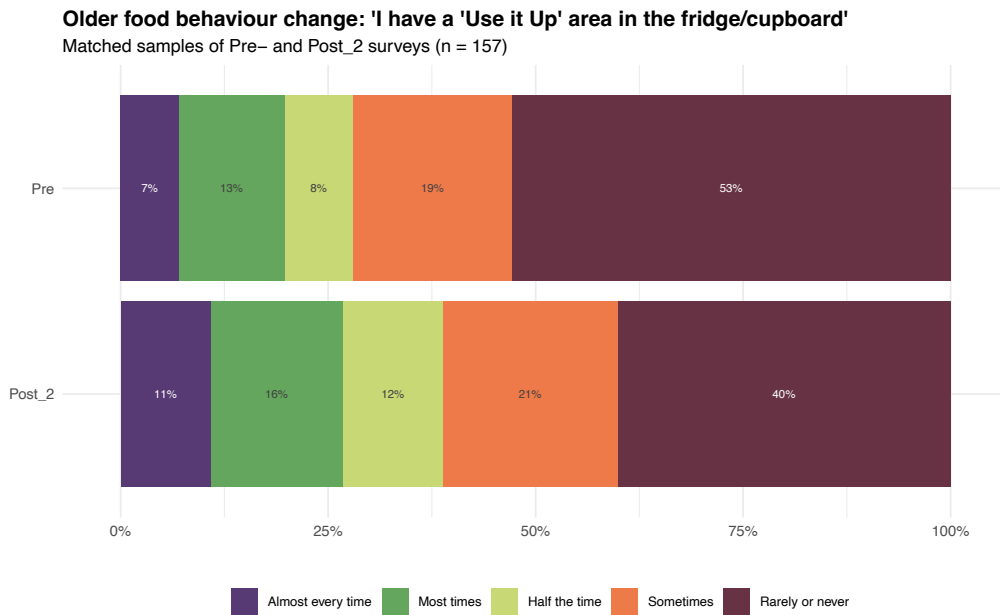


Figure 30: Perceived effectiveness of the EWT food waste reduction intervention

2.4.4 Behaviour changes between first and final surveys

In the three surveys, participants were asked about their food management behaviours regarding meal planning, food preparation, grocery shopping, leftover food use, food storage and food service. The participants reported the frequency of their behaviour regarding each aspect of food management on a 1-5 Likert scale (1 = Rarely or Never; 2 = Sometimes; 3 = Half the time; 4 = Most times; 5 = Almost every time). The analysis of the

responses from the Pre-intervention Survey and Post-intervention Survey Two revealed that there was a statistically significant ($W = 14094$; $p = 0.019$; 95% confidence level) shift in behaviour regarding management of older food, particularly setting up a 'use it up' area in the fridge or pantry (see Figure 31). However, other behaviours did not show a statistically significant change between the Pre-intervention Survey and Post-intervention Survey Two. A comparison of all behaviours between the Pre-intervention Survey and Post-intervention Survey Two is presented in Appendix 6.



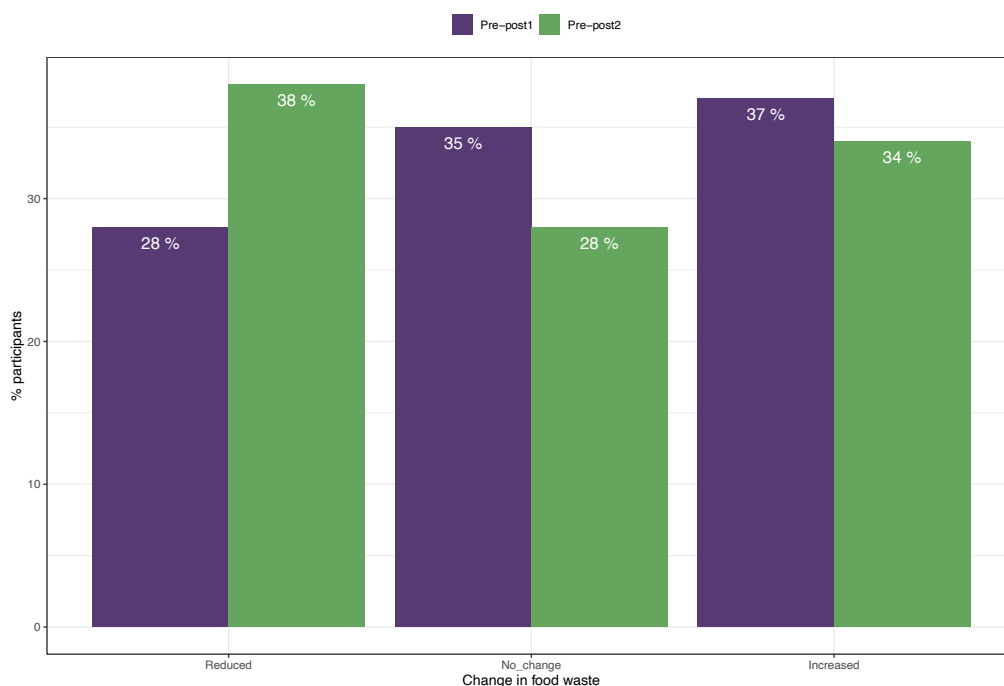
Key: pre-intervention Survey (Pre) and post-intervention Survey Two (post_2)

Figure 31: Behaviour changes regarding food storage

2.4.5 Changes to household food waste behaviour

The household food waste impact of the intervention was analysed from two perspectives – the proportion of the sample changing their amount of food waste, and the food waste reduction achieved. Figure 32 summarises the proportions of the sample that managed to change their food waste between surveys. Between the Pre-intervention Survey and

Post-intervention Survey One, 28% of participants reduced their food waste. Between Post-intervention Survey One and Post-intervention Survey Two, 38% of participants reduced their food waste (see Figure 32). Further analysis of the cohort that managed to reduce food waste indicates that older consumers and lower household income earners made up most of the group that reported less food waste over the intervention period.



Key: Pre-intervention Survey to Post-intervention Survey One (Pre-post1) and from Pre-intervention survey to Post-intervention Survey Two (Pre-post2)

Figure 32: Proportions of the sample that changed their food waste

2.4.6 Changes to the amount of food wasted

In all three surveys, participants self-reported the edible food discarded at home. The analysis of food waste quantities reported in the three surveys suggests that the average household food waste progressively reduced. In the Pre-intervention Survey, an average food waste of 2.51 cups/week was reported. In Post-intervention Survey One the average

was 2.46 cups/week and finally, and the average food waste in Post-intervention Survey Two was 2.32 cups/week. From the Pre-intervention Survey to Post-intervention Survey Two, there was an 8% food waste reduction. However, the average food waste reduction was not statistically significant. Figure 33 shows the bar charts (with error bars) of average edible food discarded based on the data from the three surveys.

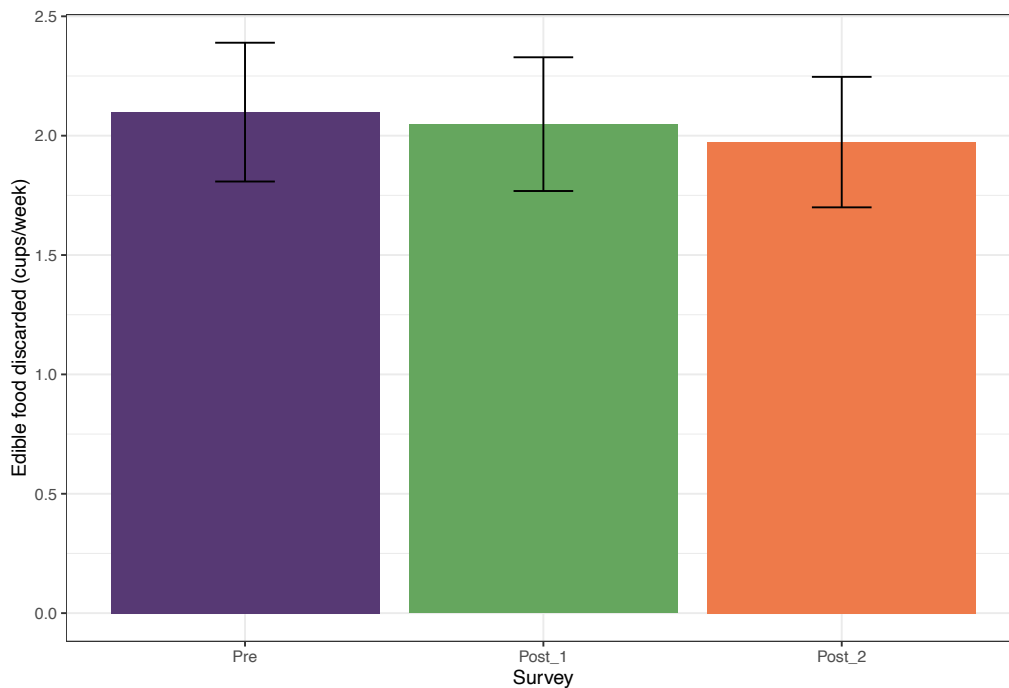


Figure 33: Food waste reported in the three surveys in the EWT intervention

3. Conclusion and recommendations

This report has presented the findings of household food waste reduction interventions implemented by IWC and EWT.

IWC organised three face-to-face workshops, sent food waste reduction tips through email newsletters, and gave residents the opportunity to complete a free online short course on reducing household food waste. They targeted younger households (18-35 years) and encouraged meal planning, eating leftovers and storing food properly to extend its life. This intervention reduced the food waste of 45% of participants who took part in any of the intervention activities. When it came to the perceived effectiveness of the IWC food waste reduction intervention, 62% of participants rated the interventions coverage of storing food correctly and eating leftover food as either *Very helpful* or *Somewhat helpful*. Although not statistically significant, the food waste reported in the second post-intervention survey represents an average 30% reduction from the baseline.

EWT developed and shared three 10-minute videos, and a short documentary, encouraging viewers to eat their oldest food items first, eat leftovers and

store food properly to extend its life. This intervention reduced the food waste of 38% of participants. Setting up a 'use it up' area in the fridge or pantry showed a positive, statistically significant change for participants in the EWT intervention. When it came to the perceived effectiveness of the EWT food waste reduction intervention, 77% of participants rated learning and using new cooking skills from the intervention as either *Very helpful* or *Somewhat helpful*, while 76% of participants rated the leftover food management aspects as either *Very helpful* or *Somewhat helpful*. The average food waste reduction between Pre-intervention Survey and Post-intervention Survey Two by the EWT target audience was 8%. However, the average food waste reduction was not statistically significant.

Table 2 presents a comparison of food waste reductions from the IWC and EWT interventions with similar initiatives elsewhere. Although not perfectly identical, average food waste reductions achieved by informational and social media campaigns in the UK and USA ranged from 9% to 23%. The average food waste reduction recorded in the IWC and EWT interventions ranged from 4% to 31%. Therefore, these results are comparable with those reported elsewhere.

Table 2: A comparison of food waste reductions from different interventions

Campaign	Intervention type	Sample size	Pre intervention Survey (Baseline)	Post-intervention	Change	
			FW (mean)*	FW (mean)*	ΔFW*	%
Eat Well Tasmania¹	Short videos	305; 155	2.51	2.32	-0.19	-8%
Inner West Council	Workshop(s)	10	2.17	1.50	-0.67	-31%
	Workshop + Elec. newsletter	15	1.68	1.42	-0.26	-15%
	Elec. newsletter	42	3.10	2.90	-0.20	-6%
	No exposure (control)	23	2.01	1.93	-0.08	-4%
Asda (UK)²	Social media – Facebook	510				-9%
	No exposure (control)					-10%
'Save More Than Food' (USA)³	Informational interventions	298-452				-23%
	No exposure (control)					+29%

¹ Data comparison is for Pre-campaign and Post-campaign Survey Two.

² Young et al. (2017). Percent food waste changes were not actual quantities but the number of food items discarded.

³ Shu et al. (2023).

* Standard cup measures (1 cup = 250 g)

The following recommendations are based on the learnings from designing, implementing and evaluating these two interventions. They will help practitioners who design, implement and evaluate household food waste reduction interventions in future to optimise the impact of their interventions. For further clarifications contact Fight Food Waste CRC or the authors directly.

Recommendations for practitioners

- > Have a clear food waste avoidance objective and key performance indicators (KPIs) for the organisation to support the allocation of financial and human resources. Having such objectives will also help to justify the need to develop adequately resourced food waste avoidance interventions within the organisation.
- > Collaborate with other delivery partners in areas such as intervention planning, implementation, evaluation and/or knowledge sharing. Collaborations create efficiencies, helping to improve pooling of resources such as tapping into skills and expertise of other partners, and improving audience reach with all partners using their own multiple media platforms to communicate with the target audience.
- > Pay attention to the content delivered and how it is delivered when using external organisations to deliver food waste messages, to reduce confusion. Check the coherence of external content developed by delivery partners in advance, including presentations, media releases, social media posts and timing of releases to ensure that consistent and complementary messages on priority behaviours and products are being delivered within agreed timeframes.
- > Globally, including in both interventions evaluated in this report, practitioners are interested in delivering interventions encouraging eating of leftovers. However, to increase impact on reducing food waste, it is important that interventions include those behaviours which are known to be most impactful, and to deliver them in a way that is most attractive to participants. These interventions include preparing appropriate amounts, developing flexible meal plans, purchasing the right amount of food and encouraging small servings.
- > Focus on no more than three impactful behaviours per intervention relevant to the target audience to make the intervention simple and effective. Including several food waste reduction behaviours within the same intervention is likely to overload the consumer and hence dilute the impact of the intervention.
- > Lack of engagement from younger age groups (18-35 years) was observed in both these case studies. Two key reasons for this could be their lack of engagement with platforms used to deliver the interventions and their lack of interest in filling out surveys. Thus, future interventions targeting younger age groups could be tested and delivered through platforms used by them, such as TikTok and online games. These could be used to provide them with challenges to compete with their peers and opportunities to share their achievements and skills.
- > To ensure information received by the target audience is more relevant, future interventions could use a pre-survey to identify food provisioning behaviours an individual is weak on and to share customised messages to improve those pre-identified weaknesses. For example, within the same intervention, an individual weak only on meal planning would be exposed to more meal planning messages, while someone who lacks skills in identifying correct quantities of food would be more exposed to messages related to identifying appropriate portion sizes.
- > Interesting interventions that engage the target audience have the ability to capture consumer attention and thus lead to changes in their food waste. We propose future interventions to trial the following interesting and engaging intervention types, instead of relying only on information sharing via emails.
 - Introducing commitments/ pledges/ goal setting and challenges followed by sharing practical solutions and tools to achieve those commitments.
 - Using engaging workshops and prompts that have a high impact on reducing food waste, alone or in combination.

- > Continuously monitoring participant engagement, taking actions to improve participation and conducting post-intervention evaluations. The following suggestions could improve the effectiveness of future evaluations:
 - Sending a pre-survey message requesting participants to be more aware of their next week's food disposal could improve the accuracy of their estimates.
 - Having a control group as well as an intervention group is important because it helps compare results between the two groups and thus improves the confidence rating of any measurement of the intervention's impact.
 - Trialling different intervention durations is desirable to detect significant behaviour changes and to examine the long-term effects of interventions.
- > Use the *Household food waste reduction toolkit: A step-by-step guide to designing interventions in Australia* developed by Fight Food Waste Cooperative Research Centre when developing strategies and implementing interventions to reduce household food waste in Australia (Karunasena & Pearson, 2023).

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Appendices

The Appendices of this report can be downloaded at:

<https://fightfoodwastecrc.com.au/project/evaluating-the-effectiveness-of-priority-household-food-waste-reduction-interventions/>





fightfoodwastecrc.com.au

