





This research was commissioned by the Project Steering Group for the *Designing effective interventions to reduce household food waste* project. It is part of a four-year research project delivered through the Fight Food Waste Cooperative Research Centre.

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Focus group findings of attitudes to food waste
Report background:
"Designing effective interventions to reduce household food waste" is a Fight Food Waste CRC's research project. The project reports will provide evidence-based insights covering food waste behaviours and attitudes of Australian households, quantification of perceived and actual household food waste, advice regarding priority segments, identification of global best practise interventions, household food waste reduction interventions for priority segments, messages for selected intervention and cost-effective methodologies for evaluating the impact of selected interventions.
How to read the reports in this series:
This report is one of six reports published in the series "Australian household food waste". A summary of the implications and evidence to support these is provided in "A summary of behaviours, attitudes, perceived and actual food waste" whilst the other five reports provide detailed results. These being: "Survey findings of behaviours and perceived food waste", "Electronic-diary findings of recorded food waste and disposal methods", "Kerbside bin audit findings of actual food waste", "Focus group findings of attitudes to food waste", and "Choice model findings of food waste reduction interventions".

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1. Background

This research sets the baseline for the quantity and value of food waste generated in Australian homes and how the amount of waste varies with the level of knowledge, attitudes, and behaviours around household food management. The research informs the Fight Food Waste Cooperative Research Centre (FFW CRC) and other interested parties of the composition of household food waste and where most food waste occurs.

The FFWCRC is tackling the problem of food waste by investing in research that reduces the amount of food wasted through the food value chain, transforms unavoidable waste into innovative high-value co-products, and engages with industry and consumers to deliver behavioural change. There are three programs under FFW CRC – REDUCE, TRANSFORM and ENGAGE. This research is an integral part of the ENGAGE program.

The key objective of FFWCRC ENGAGE program is to provide interventions designed to tackle consumers' food waste behaviour by:

- benchmarking national food waste knowledge, awareness and behaviours in household food management and food waste to gain a deeper understanding of the causes
- 2. identifying key target audiences and unpacking the barriers and opportunities for them to adopt food waste avoidance behaviours
- 3. increasing knowledge and skills in household best practices related to food purchasing, storage, preparation and use of leftovers
- 4. providing support for institutional and inter-generational transfer of knowledge and skills in more efficient food planning, purchasing, preparation and consumption
- 5. providing a platform for increased knowledge and awareness of food wastage in business.

This report presents focus group findings from phase 5 of the research *Australian household food waste* (See figure 1 and Figure 2).

The online multi-phased study involved 4 research phases conducted with the same respondents. It started with a national survey of 2885 respondents who agreed to take part in all phases of the research. They had to complete the survey and, these same respondents, were recruited to undertake a 7-day E-Diary that coincided with their weekly bin collection. In the E-Diary they were asked to record all the food wasted from their home including food waste disposed of in the home (tipped down the drain, composted, fed to animals etc.). A sub-set of these (495) had their bin physically audited for food waste which was weighed.

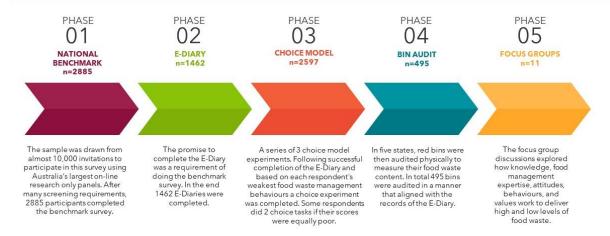


Figure 1: Research phases



Figure 2: The methodology for the whole project

2. Methodology

The research involves 11 focus group discussions to better understand causes of food waste, establish differences in behaviours between household types that lead to greater or less food waste, determine how levels of knowledge, skills and experience in managing food in the household impact food waste, and finally, explore lifestyles (the interactive effects of others in the households on food waste).

2.1. Objectives and Timing

Objectives of the focus group discussions:

- To better understand causes of food waste
- To establish differences in behaviours between household types that lead to greater or less food waste
- To determine levels of knowledge, skills and experience in managing food in the household
- To explore lifestyles (the interactive effects of others in the households on food waste)

Timing:

• 10th February – 5th March 2021 – 11 virtual focus group discussions

2.2. Screening Criteria

All participants met the following screening criteria:

- Completed phase 1: the benchmark survey and an electronic food diary
- Agreed to be contacted to participate in qualitative research
- **Joint or main household food manager**: determined by benchmark survey responses, responsible for at least 3 or 5 household food management activities
- Location: lives in Australia

2.3. Methodology

Table 1: Focus group methodology

	Method				
	Household food management	Segment	State	Age	Food waste per capita
Group 1	Mainly responsible	Above average household income	Mixed ACT, NSW, VIC	Mixed 35-74	High
Group 2	Jointly responsible	Low food wasters	Mixed QLD, NSW, VIC	Mixed 25-74	Low
Group 3	Jointly responsible	Under 35 years old	Mixed QLD, NSW	Mixed 25-34	High
Group 4	Mainly responsible	Low in household food management skills	Mixed ACT, QLD, NSW, VIC	Mixed 55-64	Low
Group 5	Mainly responsible	Young family (Children mostly <17)	Mixed NSW, VIC, WA	Mixed 35-54	High
Group 6	Mainly responsible	Under 35 years old	Mixed NSW, VIC	Mixed 25-34	High
Group 7	Jointly responsible	Low in household food management skills	Mixed ACT, QLD, NSW, VIC	Mixed 25-74	High
Group 8	Jointly responsible	Young family (Children mostly <17)	Mixed QLD, NSW, SA, VIC	Mixed 25-54	High
Group 9	Mainly responsible	Low food wasters	Mixed QLD, SA, VIC, WA	Mixed 25-74	Low
Group 10	Jointly responsible	Above average household income	Mixed ACT, NSW, TAS, VIC	Mixed 35-64	High
Group 11	Mainly and jointly responsible	Under 35 years old	Mixed NSW	25-34	High and low

2.4. Approach to the design of the qualitative research

In 8 of the focus groups, participants came from households reporting above average per person food waste while 3 were low wasters of food.

Household food management responsibilities

The qualitative study revealed that 54% of the sample completing the benchmark were main food managers responsible for all the activities to do with food management from planning, shopping, storing preparing food and disposing of food. 46% were responsible for some of these activities. It was decided to explore the differences, so 5 focus groups were with main food managers and 5 with joint food managers.

Lifestyle and working arrangements

The qualitative study revealed a number of correlations with high levels of food waste. Namely:

- Wealth coming from above average household incomes
- Families with children under 17 years of age busy families
- Under 35 year olds

2 groups were conducted with lower food wasters, in the hope of learning how this outcome was achieved, and 2 groups with people who scored low on food management skills in the benchmarking study.

3. Findings

3.1 Key Findings

Many factors contribute to food not being eaten. Starting with a widespread attitude that there isn't a personal food waste problem, structural realities of life that make food management challenging (such as affordability and competing priorities that make food management a low order issue), lack of knowledge about food and how to repurpose and use ingredients, lack of cooperation between household members to minimise food waste, lack of food management expertise, entrenched attitudes that undermine food waste prevention (e.g. it is always better to have too much than too little in the fridge and on the table), behaviours that increase the risk of food being wasted (both conscious and unconscious [habits]), and finally, values that discount the environment and prioritise individual rights and preferences over all else.

Another important contributing factor to food waste and to the lack of awareness of the food waste issue is the widely held belief that the only issue is when food waste is sent to landfill. This has led to the strong position that composting is virtuous and hence there is little awareness of all the effort embedded in the food being lost. If unaddressed this could lead to adverse outcomes for the FOGO (food organics garden organics) bin introductions. People feel they are doing the right thing by disposing of food (either composting at home or in a FOGO bin) rather than addressing the root issue of eating all the food they buy and hence not wasting any of it.

Figure 3 summarises the key findings from this study.



Figure 3: Focus group key findings

3.1. Contextual analysis



Figure 4: Contextual Analysis

3.2. Context of managing food and its waste, including the role of capability

3.2.1 Who manages household food?

Food is important – it meets important needs for people; more than "food for fuel"; making food waste a secondary issue.

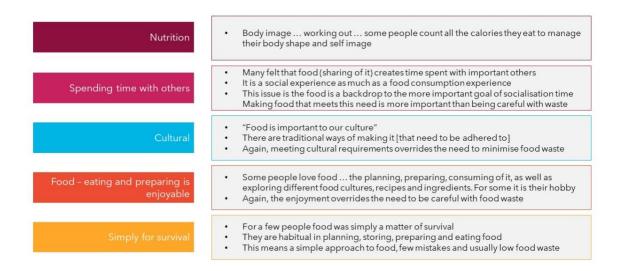


Figure 5: Who manages household food?

3.2.2 Households are different

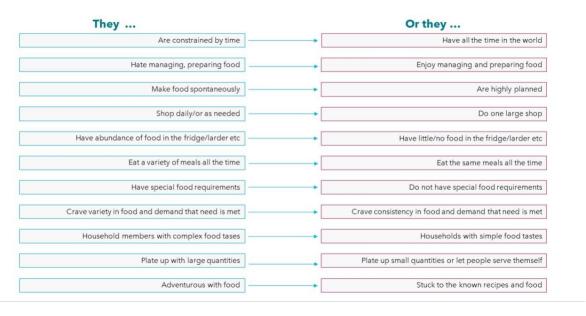


Figure 6: How Households are Different (part 1)

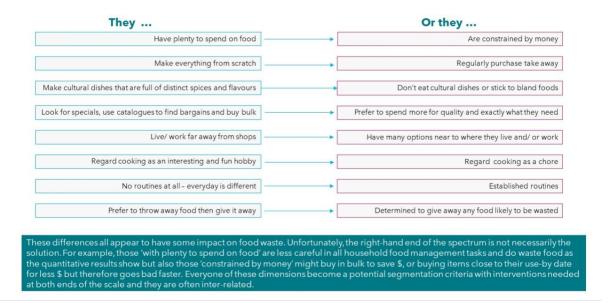


Figure 7: How households are different (part 2)

Figure 8 below provides quotes from the focus groups to supporting above claims.



Figure 8: Quotes that Support the Finding that Households are Different

3.3. Structural factors that make effective food management complex

3.3.1 Structural factors that make effective food management complex

Varying numbers present at meals

- "The boys sometimes don't come home for dinner, but we always make sure there's enough food for the whole family just in case"
- Some households don't know who will be in for dinner.
- Those with partners travelling for work regularly, younger adults with highly variable schedules
- This makes planning difficult and leads to food waste if people fail to turn up. Buying just in case becomes a problem with food to dispose of or use

Confusion over roles

- Some people end up sharing the food management process; especially if multiple parties work
- This can lead to more than one person maintaining a shopping list, which can lead to double-ups

Last minute decisions on eating out

- "When we are invited to go away for the weekend last minute, social plans come first"
- Some households plan and buy for meals to be eaten at home but then they aren't
- This is common in households where eating out is common. This tends to be the more wealthy where cost is not playing a major role in decision making

Time pressures reducing focus

- "We're both working and have kids"
- Where the main food manager is also working, studying, looking after parents or children; especially if work is full time then food management appears to be given less focus
- The challenge is mainly on getting food prepared rather than managing the end to end process

Special dietary needs

- "We try to always keep [different dietary] options in the house"
- Special dietary needs mean the food manager needs to manage multiple meals for the household
- This makes ingredient use difficult and requires a lot of special food to be on-hand

Individual food preferences

- As with special dietary needs many complained of fussy eaters causing challenges in food planning
- Sometimes these were young children but people were saying increasingly people have strong preferences such as vegetarianism and veganism, which is more than fussy but a requirement set in stone
- "Our kids might just refuse to eat the meal"

Figure 9: Structural factors that make effective food management complex

3.3.2 Characteristics associated with better food waste management

Figures 10 to 12 identify 16 characteristics associated with better food waste management.

Manage to a budget

- The need for food affordability drives more care with waste
- "Throwing out that much food every week, that's \$2000 a year... that's a holiday"
- Managing to a budget, looking for food on special, buying food to a planned weekly set of menus appears to result in less food waste

Love food that is simple and can be used for multi purposes

- "We cook stir fry one night then curry another with the same vegetables but a different jar sauce"
- Food with fewer ingredients that can be used in different ways easily appears to be a recipe for reducing food waste
- Having knowledge and skills to make different meals from the same ingredients also makes managing food waste easier

Believe wasting food is a sin

- "Even if we have eaten it for 3 days, someone will bite the bullet and eat the leftovers"
- Some talked about almost a religious requirement to avoid wasting food
- Believing that wasting food while others are hungry is wrong ethically and morally
- This value system appears to be handed down from the previous generation

High levels of knowledge and expertise in food planning and preparation

- "I will be able to create a meal with that leftover half cucumber"
- Able to repurpose left-overs especially into different meals
- To use ingredients to prepare for other meals
- This second stage planning was relatively rare because few prioritised food waste to the degree needed to motivate such behaviours

Love leftovers

- "Things taste better the day after". This love of left-overs is a very positive way to make sure food is not wasted. Where left over food is highly desirable, food waste appears lower
- Having demand for any extra food produced makes managing food waste easier
- Enjoy researching recipes to use up leftovers
- Like the ease of reheating or bringing a meal from yesterday for lunch today; "I'm looking forward to my dinner tonight because I don't have to cook"
- Having demand for any extra food produced makes managing food waste easier

Figure 10: Characteristics associated with better food waste management – 1-5

Consistent diets

- "All our meals are basically the same ... we have a stir fry with vegetables and just change the meat element"
- This makes the buying and preparing process simply and highly habitual
- If the habits succeed in minimising food waste this appears to be a positive. Again their were some households who still managed to produce food waste with highly consistent diets because of poor inherent behaviours

Buy the same ingredients

- "Every Sunday, we buy the same things"
- · Or core set of ingredients every week
- Again this simplifies management and usually appears to result in better food waste outcomes
- But sometimes ingredients are not available and those with few skills often make mistakes when asked to change the plan on the spot

Primarily eating at home or eating out

- "We cook our own meals at home each night as it is healthier and saves money"
- Enjoy home cooking and avoid eating out in restaurants or grabbing takeaway. This maximises the ability to manage
- But it is not always true as some plan to eat out or have takeaway and don't have any food in the fridge. Their food waste can be less than those who always eat at home and might have more food in the fridge going off

Never shop just in case

- Only purchase the food they need and avoid buying items to have on hand "just in case"
- Families with older children, grandchildren or extended family who visit frequently tend to purchase food that they themselves would never eat and thus it spoils
- This is similarly true of those who socialise/ entertain on a regular basis, i.e. keeping food on hand for gatherings

Usually, same numbers are present

- "It's just my partner and I so it's easy to know how much to cook. We just cook the same amount each time"
- Consistency at the table seems to improve food waste
- These households tend to have set schedules and routines relating to meal times so they generally know how many people will be there and how much each person usually eats
- This assists with food waste management

Figure 11: Characteristics associated with better food waste management - 6-10

Shopping with purpose

- Either out of necessity or habit, have limited time for browsing an entire store or "zombie shopping" wherein random items end up in the trolley even when using a list
- Able to avoid temptation and pay less attention to marketing and displays

Use freeze

- Use freezer to store foods before they spoil or to freeze meal size portions of leftovers
- Knowing and recording what is in the freezer and having plans to use it
- "We often cook extra pasta sauce and throw it in the freezer for a night we don't feel like cooking"
- · "Food always gets eaten in the freezer"

Sticking to routines

- Have set routines around when shopping is done, who does the shopping, types of meals they prepare and who is there to eat them
- "A bag of onions will last two bags of spuds...
 every three weeks we will get spuds, carrots
 cabbage, every 2 weeks will also get onions"
- Less likely to go "off script" and buy items they don't need or make up part of their usual menu

Getting creative with ingredients

- Have a repertoire of recipes/meal ideas in their head to use up whatever they find left in the fridge
- "We will use everything up that's in the fridge, even if it is close to going bad, we will wrap it up in other things"
- Plan one meal a week which is made up of whatever they have in the fridge

Store leftovers in meal-size portions

Packaging leftovers in meal-size portions (either frozen or put in the fridge) made it more likely that they would be taken to work the next day and not left to spoil

Know how to use 'scraps

- Taking food scraps and creating new dishes;
 - "I use gravy as a sauce for multiple meals"
 - Turning extra cooked rice into fried rice
 - Using vegetables off-cuts as soup stock

Figure 12: Characteristics associated with better food waste management - 11-16

3.3.3 Characteristics of high food wasters

Figure 13 identifies 11 characteristics associated with high food wasters.

Do not manage to a budget

- High likelihood of extra items making their way into the trolley
- Low awareness of the true cost of waste (and low interest as they don't have a budget for food they do consume)

Disorganised/lazy

- Blame purchase of double-ups on having more than one person managing the list
- Visualise fridge or pantry while at shops rather than physically taking stock and making a list

Want food variety ... immediately

- So they want the food they feel like, not what was planned for
- Seeking instant gratification of food preferences
- Will opt to go out for a meal to satisfy a craving rather than using what is at home

Don't know what is in the fridge

- Many household food managers believe they can remember what's in the fridge although they probably don't really know for sure
- Because they think they know they don't look.
 It leads to errors on shopping

Believe wasting food is part of life and is not prioritised

- "It [food waste] is a small thing not worth worrying about"
- "some people think we are a small part of a much bigger issue, so care factor is low"
- · "we can't avoid it so we can't blame people"
- · "if it's bruised, we have to chuck it"

Lacking food skills/expertise and disinterested in building them

 Lack knowledge on appropriate portion sizes, measurements of ingredients to make a dish, ways to make use of ingredients beyond the dish they are purchased for, unsure of how to keep leftovers fresh

Love cooking different food, using recipes

- Use lots of recipes calling for different and not commonly-used foods
- See cooking interesting meals as a health and fun hobby - waste is a by-product of their hobby

Don't know what they plan to eat in the coming week

- Only a minority have a detailed plan for the week's meals - they want to see what they feel like on the day and cook what everyone wants
- This is a crucial attitude that leads to high risk of food waste

Hate leftovers

- "My husband calls them WIFO ... 'what is left over', and he won't touch leftovers"
- "we host a lot of BBQs and anything cooked that way has to go in the bin. It's gross to reheat it"

Don't make lists or stick to them

- Some people make lists and stick to them while many do not
- The 'no list' people sometimes say they keep a mental list

Believe composting negates food waste

- "It's ok for fruit and veg to go back into the earth"
- "We would have less waste if our Council supplied FOGO bins"

Figure 13: Characteristics of high food wasters

3.3.4 What kind of meals are prepared in Australia?

Australian meal types can be classified as follows:

Australian staples

- Meat and three vegetables remains a key staple
- It includes roasts, steaks, BBQs, corned beef, casseroles, soup
- Stir-fries and simple pasta meals (Spaghetti Bolognese) are increasingly regarded as staples

Convenience meals

- Convenience meals range from hamburgers, tacos, pasta meals, meat pies, frozen meals
- Convenience also includes the single meals
- But also covers takeaways

Culturally inspired meals

- The key culturally driven meals come from cultures that include Greek, Italian, Lebanese, Indian, Malaysian, Chinese, Korean, Thai, Indonesian and probably many more
- They are traditionally prepared and often require skills passed on from parents and grandparents, or specific recipes
- Dishes require specific spices and unique fruits and vegetables

One pot meals - simple

 Core set of ingredients, easy "go-to" meals that can be thrown together quickly and satisfy a range of tastes in the household

Other prepared meals

- These can include recipe meal kits such as Hello Fresh that come with the required ingredients already measured out
- Frozen/packaged meals from a supermarket, or easy meals like cook the pasta and pour a jar of sauce over it

Gourmet meals

- Many Australians are becoming more adventurous in their cuisine and are trying to cook a wide range of culinary pleasures
- These are characterised by research, planning, recipes, need for special ingredients and new ways for cooking

Figure 14: Meals prepared in Australia

Food that typically gets wasted includes:

WASTED FOOD

- Fruit buying too much and it spoils
- Bread buying a loaf that doesn't get eaten
- Sauces made for a meal (often get wasted)
- Cheese goes hard
- Milk and other dairy goes off
- Specific vegetables required only for one recipe that are not used in any other dishes
- Spices that come in large quantities but are used in small amounts in dishes

WAYS OF AVOIDING WASTE

- X Turn the fruit into a smoothie
- Slice or cut the loaf of bread in half and freeze half; or freeze what's left at the end of the day
- Y Putting left over meals in single portion containers encourages use the next day
- Preparing doggie-bags for guests to use the leftover food at dinner parties and parties
 - Research other recipes to use vegetables and spices purchased for other meals

Figure 15: Food that typically gets wasted

3.3.5 How are food management skills developed?

Where is food preparation learned? Preparing oneself to manage food appears to be a very ad-hoc process.

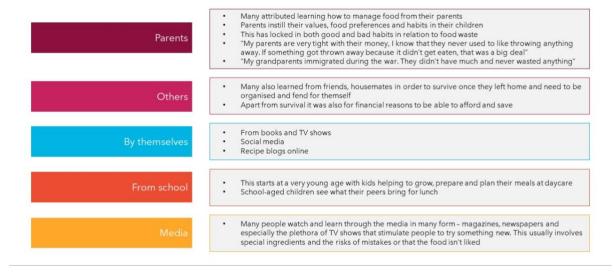


Figure 16: Where food preparation is learned

3.4 What food management habits develop?

3.4.1 What cases leftover food, and what foods are left uneaten?

The percieved causes of food waste are:

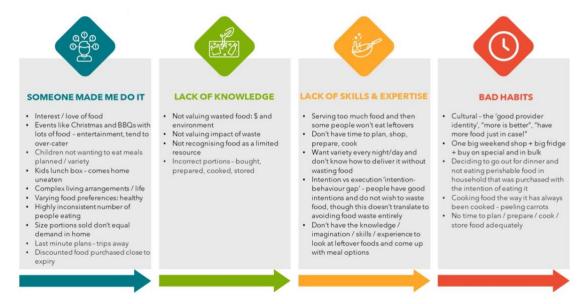


Figure 17: Perceived causes of food waste

3.4.2 Food management skills

3.4.2.1 Meal planning

Figure 18 summarises the contextual issues and positive and adverse habit relating to meal planning.

Contextual issues



- Planning is dependent on the individual's personality. Not everyone likes the rigidity of mapping out what they will eat in advance.
- · Planning takes time and energy

Those with positive outcomes



- · Checking what is in the fridge and pantry
- Keeping a list just of staples and buying other foods based on sale/ season/ on a whim
- Set meals planned out for the week
- Cooking extra for leftovers portioning correct lunch packs, splitting it up in advance
- Knowing how many people will be eating in the household
- "We cook the same few meals on rotation so planning is easy"

Those with adverse outcomes



- Making up meals as they go along using creativity to decide what can be cooked with ingredients in home
- Like the flexibility of choosing what to cook on a whim
- Not taking into account any mealtimes spent away from home when planning a grocery list
- Forget to write a shopping list, or forget to use it
- "We try to plan meals but having a young child means we can't always cook what we intended to that night"

Figure 18: Contextual issues and positive and adverse habits relating to meal planning

3.4.2.2 Shopping for food

Figure 19 summarises the contextual issues and positive and adverse habits relating to shopping for food.

Contextual issues



- Different ways of shopping:
- 1. One big shop and small 'top up' shops
- One large shop each week contributing to most food waste as things deteriorate / are not eaten as planned
- Buying things as needed reducing superfluous purchases and eating fresher produce
- Having young children fewer shopping trips
- Living closer to shops easier to make quick top up trips

Those with positive outcomes



- Sticking to a shopping list
- Purchasing foods they have the skills to cook
- Only buying enough perishable items that they will have time to eat
- Buying ingredients that are in season that are fresher and may last for longer
- Buying food as needed less to store that could go bad
- Buying the same foods as part of a routine, in tried and tested portions

Those with adverse outcomes



- Buying foods on special / at a discounted price:
 - Not having skills to cook food spontaneously bought
 - Not having time to cook with it before it goes bad if they buy it in addition to other food planned
 - Items bought in bulk / larger quantities may not get cooked or eaten
- "From Woolies or Coles, you only need 8 sausages but you've gotta buy 12 in a pack"

Figure 19: Contextual issues and positive and adverse habits relating to shopping for food

3.4.2.3 Food preparation

Figure 20 summarises the contextual issues and positive and adverse habits relating to meal planning.

Contextual issues



- Different ways of preparing:
 1. Organised and methodical
- 2. Disorganised and ad-hoc

Those with positive outcomes



 Equipped with skills and knowledge of how to prepare lots of ingredients in a variety of

Those with adverse outcomes



- · Poor preparation skills
- Wasteful preparation due to laziness / clumsiness

Figure 20: Contextual issues and positive and adverse habits relating to meal planning

3.4.2.4 Cooking

Figure 21 summarises the contextual issues and positive and adverse habits relating to cooking.

Contextual issues



- Different ways of cooking:
 - Organised and methodical, sticking to a recipe / cooking a familiar recipe
 - Disorganised and ad-hoc: making it up as you go along

Those with positive outcomes



- Cooking the meals that were planned
- Cooking the right amount of extra for leftovers
- "Meal prepping" preparing meals especially for lunches during the week in advance
- Good knowledge of different cuisines and big repertoire of recipes - to adapt based on what food is in the house
- Creativity to repurpose leftover portions of ingredients not cooked from earlier meals into something different

Those with adverse outcomes



- Poor cooking skills:
 - 1. Cooking unpleasant or inedible food
 - 2. Burning, over or under-cooking food
 - 3. Spilling food
- Cooking too much food
- Lacking knowledge around how to cook small portions of leftover ingredients to turn them into new, creative and enticing meals

Figure 21: Contextual issues and positive and adverse habits relating to cooking

3.4.2.5 Storage

Figure 22 summarises the contextual issues and positive and adverse habits relating to food storage.

Contextual issues



- Different ways of storing:
- Utilising the fridge and freezer to prolong food life
- Not keeping perishable foods in fridge of freezer, instead only eating foods while fresh.

Those with positive outcomes



- Transparent containers are used when food is stored in the fridge to make sure foods can be seen and remembered
- Only needing portions of ingredients and storing the remainder for another meal
- Storing uncooked foods that weren't eaten from the meal
- Storing foods that were left over from the meal on a plate
- · Understanding ways to store food properly
- "Any bread we won't eat that day, we slice and put in the freezer"

Those with adverse outcomes



- Lacking understanding of how to keep foods fresher for longer – when to use fridge, when to use freezer, when to store in plastic or reusable materials, containers, etc
- Incorrect storage behaviours or habits keeping fruit or bread on bench/pantry for too long
- Not utilising the fridge or freezer to keep things fresh - knowledge of how to better store foods but preference for only eating fresher ("healthier") foods, and discarding older food

Figure 22: Contextual issues and positive and adverse habits relating to food storage

3.4.2.6 Food disposal

Figure 23 summarises the contextual issues and positive and adverse habits relating to food disposal.

Contextual issues



 Subjective opinion of when food is still fresh enough to eat or no longer edible: touch, smell, sight of food

Those with positive outcomes



- Transparent containers are used when food is stored in the fridge to make sure foods can be seen and remembered
- Only needing portions of ingredients and storing the remainder for another meal
- Storing uncooked foods that weren't eaten from the meal
- Storing foods that were left over from the meal on a plate
- Understanding ways to store food properly

Those with adverse outcomes



- Lacking knowledge of whether a food is still safe to eat: concerns over health and food poisoning a higher priority than reducing food waste
- Food no longer fresh and must be disposed of
- If food is thrown in the compost bin, worm farm or fed to pets, it is not seen as wasted

Figure 23: Contextual issues and positive and adverse habits relating to food disposal

3.4.3 Where are food management skills lacking?

low in household food above average household young families (children under 35s management skills income mostly <17 years old) · Recognition food waste matters · Recognition that food waste · How to store food · Leftovers usually stored in fridge -· Food rotation matters · Having food storage containers most did not freeze food · Food buying (for a purpose) · Only willing to use the freshest · How to plan ahead · Containers aren't marked with ingredients of the highest quality · How to use food for a new dates in the fridge Some misunderstanding / purpose Use by dates and knowing what is mistrust with best before vs used means mainly responsible for jointly responsible for household food household food low food wasters high food wasters management management Responsibility falls on the · Avoiding confusion with others Many underestimate their food Recognition that food waste shoulders of one person - could buying food waste and many see composting matters benefit from the insight of others, as virtuous. All food not eaten is get "stuck in a rut" or repeat bad wasted food habits without realising · For genuine low food wasters they need to know this is a good thing and reinforcement

Figure 24: Where are food management skills lacking?

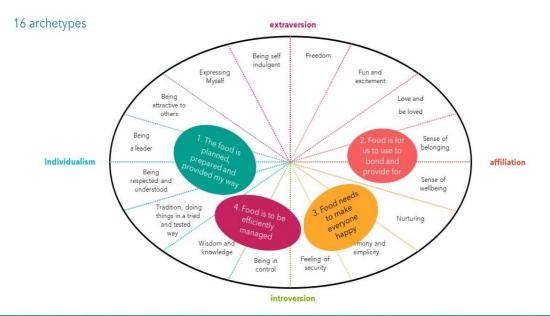
3.5 What values are associated with food and its waste?

3.5.1 How important is food? What values are at play with food waste?



Figure 25: Importance of food and values at play with food waste

3.5.2 Instinct & Reason's need map



When it comes to food, there are at least four emotional needs gratified by providing food to others (fulfilling archetypal drivers of different personalities). Change strategies need to recognise the underlying emotional needs and develop solutions that work to gratify these need states and deliver better food waste outcomes.

Figure 26: Instinct & Reason's need map

3.6 What social norms exist around food and food waste?

3.6.1 Is food waste perceived as socially acceptable?

young families (children mostly <17 years old) low in household food above average household under 35s management skills income Constantly seek out of home solutions to food Eating out and takeaway seen to be luxuries rather than wasteful For those with children, no skills are Rationalised by being time poor, • Food waste is most likely to be Forming bad habits in early adulthood considered to be normal for those with young kids, fussy eaters or teens with big appetites Enthusiastically share stories with other parents about the amount of Lack of food management skills seen to be a humorous facet of young adult life rationalised by this group as having insufficient time Or avoiding food waste just not worth my time And of course, convenience kicks in being passed down food they end up throwing out Being time poor almost a badge of honour and empathised with easier to eat out/ get takeaway than Take pride in using "only the best" mainly responsible for jointly responsible for high food wasters low food wasters household food management household food management Critical of being the only one in charge and not having enough time to properly plan ahead Place blame on the other person for over-purchasing or being frivolous with waste Could be a source of advocacy as they claim they intervene at social functions to find uses for leftover food and do the Proud of their interesting and varied diets and knowledge of exotic foods Respond to cooking shows, magazines etc by buying the ingredients for recipes they often but not always get around to making same with guests "I saw a colleague a same with guests "I saw a colleague at work throwing out a whole salad in a bag from the supermarket when they went out for lunch instead, so I took it to put in my compost bin" They perpetuate the social values around minimising food waste and encourage thinking about new behaviours

Figure 27: Is food waste perceived as socially acceptable?

3.7 What food management habits are developed?

3.7.1 What might influence Australians to reduce food waste?

3.7.1.1 Improving food management skills using tools to help storing of food in fridge

Contextual issues with getting better at storing food



- Most people feel they already store things properly, and it is others that would benefit from these interventions
- The idea of a digital app that sends push notifications to advise when foods need to be eaten is well-liked and ticks a lot of boxes, yet there is concern over the time it will take to put the required data in so that the app knows when to tell you if the food has expired. For example, an app letting you know what's in the fridge could be a starting point but needs more features

What tools might work?



- An app letting you know what's in the fridge: for joint household food storage managers, a database showing what is in the fridge and how old the foods are reduces some unknowns when other food managers aren't around
- Free fridge/ freezer storage packs and a marker: similarly, good for multiple household members that enter the kitchen at different times
- Fridge or freezer thermometer: "I'd definitely give it a go"
- "Cheat sheets" showing cooking tips on how to store common foods

What is not so good about using tools to help store food better?



- A colour-codded fridge system: this idea is good for some planners that like their fridge tidy and organised, but would be too much work for others; "It just seems like more work to have to colour-code foods in the fridge. We're already busy enough cooking for the kids!"
- A colour-coded fridge system: "No, I don't think I'd use it. I think I'd just get lost.. which colour goes with which day?"
- Fridge or freezer thermometer: "If something freezes at the back of the fridge, I'll just thaw out the food and eat it. I don't need it"

Figure 28: Improving food management skills using tools to help storing of food in fridge

3.7.1.2 Improving food management skills using better tools to get portions right

Contextual issues with getting portions right



- The first step is triggering recognition of the need to change food management behaviours for the purpose of reducing food waste
- Once people recognise the need to change they will identify tools and new habits that will reduce their food waste
- It's important to realise that every household has a unique set of structural challenges that means a bespoke strategy is needed to minimise food waste
- This means they have to think about it and then trial various strategies to achieve the goal

What tools might work?



- Free measuring cups provided by supermarket: Complimentary would increase uptake
- Measuring cups would help with simple tasks like cooking just enough rice or pasta for the family
- A "cheat sheet" for what a portion of each food is would be ideal, with pictures for time-poor parents

What is not so good about using tools to get portions right?



- Free measuring cups provided by supermarket: "They are just going to end up in a drawer"
- "We have no room for these"
- Some people don't like measuring out ingredients
- "They need to come with an information sheet or they won't mean anything"

Figure 29: Improving food management skills using better tools to get portions right

3.7.1.3 Improving food management skills by learning how to use leftover food better

Contextual issues with learning how to use leftover food better



- Some people enjoy eating leftovers
- Other people do not enjoy leftovers
- Leftover foods that get wasted include:
 - 1. Uneaten portions of cooked meals
 - 2. Small portions of raw ingredients not used from an earlier meal
 - 3. Food brought home in lunchboxes

What tools might work?



- An app that suggests planning meals with ingredients to be used in more than one meal: The idea of learning what to do with leftovers was well-liked
- An app that tells you what recipes you can make out of leftovers: Similar to the first app, providing creative recipes to try new foods and cuisines can refresh leftovers and make them interesting again
- On supermarkets offering recipes: "If I could cook once for the next three days, but there be three different meals, that would be great"
- Free cooking courses to learn how to use leftovers

What is not so easy about teaching people about leftovers



- "Don't leftovers lose nutritional value?"
- An app that suggests planning meals with ingredients to be used in more than one meal: "It sounds good in theory, but I probably wouldn't use it"
- Some people were sceptical of technology, but would be open to fact sheets if the supermarkets provided them, or tips on social media

Figure 30: Improving food management skills by learning how to use leftover food better

3.7.1.4 Improving food management skills by getting better at checking fridge stock before shopping

Contextual issues with tools to check the fridge



 Costs can be a barrier for some users not wanting to invest in expensive technology such as a smart fridge that tells you what is inside

What tools might work?



- Digital apps mean multiple family members can check in real-time and avoid buying the same foods
- Encouraging simple paper shopping lists:
 "The kids know when we run low, it goes on a bit of paper. It's our shopping list, I know what to get when I go shopping. I like the old pen and paper, I'm old fashioned"
- "I'd love it, it would definitely assist with me.
 I'm a planner."

What is not so good about tools to check the fridge?



- An app that tells you what recipes you can make out of leftover ingredients:
- "We just bought the new Samsung Family Hub. I can actually go on my phone and see what we have in our fridge. It's a great novelty, but I only used it that first week we had it... I can do my online shopping with Woolies at the fridge, everything is online... it has all these great gadgets...recipe menus... but I just haven't had time!"
- "If I did actually have 30 or 40 items in the fridge, I doubt I'd have time to enter them one by one"

Figure 31: Improving food management skills by getting better at checking fridge stock before shopping

3.7.1.5 Improving food management skills using messaging

Contextual issues around messaging



- Messaging which connects food waste reduction with good parenting will resonate to parents who feel guilt about not having enough food
- Powerful messaging to heighten awareness of volume of food waste and impact on a) financial budget b) unfair distribution of food in society
- Tangible messaging, "you could save \$50 week, that's \$1300 a year or a trip to Queensland"

What tools might work?



 Tools to calculate own food waste and financial impact of food waste for their own household budget hit home

What is difficult around getting the right messaging?



- Nothing emerged in the focus groups that was adverse except to try and avoid making people feel bad or shamed.
- Whilst there are a few people who would only respond to a confrontation message they are few and this would have an adverse impact on busy and wealthy households.
- Instead the messages should all remain positive and promote an intention to change

Figure 32: Improving food management skills by using messaging

3.8 Appeal of various behaviour change ideas

3.8.1 Interest in and opportunities to reduce food being thrown away

3.8.1.1 What are the barriers to change?



Figure 33: Barriers to change

3.8.1.2 What are the potential drivers of change?



Figure 34: Potential drivers of change

3.8.1.3 Strategies to encourage food waste reduction

SAVING MONEY BY REDUCING FOOD WASTE

Because consumers underestimate the amount of food waste, they produce they also underestimate what it is costing them. By promoting the value of the food they waste coupled with the desire to not waste this represents a potent trigger to start the behaviour change process.

It will produce a recognition in many that change is needed. However structural challenges are likely to make change difficult and change strategies are needed to assist with each of the structural challenges faced by households

REDUCING FOOD WASTE BENEFITS THE ENVIRONMENT

While this appears a weaker driver, the qualitative work suggests it might be a more powerful trigger of change than the value of food waste, especially for the wealthy who are a significant source of food waste.

The money lost for the wealthy is of low value compared to their time and so another motivation is needed to start the change process.

Again, just wanting to change is only the start f the process as all the challenges identified earlier in the report will work to undermine change.

The key point is that most people exist in a state where they believe they are not wasting enough food to warrant their attention. Interventions must start with driving the recognition that change is necessary then providing ways to facilitate and reinforce better behaviours and attitudes. Some knowledge is needed through an education campaign.

Figure 35: Strategies to encourage food waste reduction

4. Developing strategies to reduce household food waste

4.1. Model of Change



Figure 36: Model of change to reduce household food waste

There is a lack of tools that facilitate reducing food waste at present and there are great opportunities to provide them.

Lack of knowledge, experience and expertise creates habits (mental shortcuts) that lock in food waste behaviours. Habits are hard to change and require a desire, strategies that facilitate change and then reinforcement strategies.

Lack of knowledge, experience and expertise contributes to food waste. Few understand that the production, distribution and marketing of food costs CO2. Instead the focus is on reducing land fill - so they compost and do not see this as wasting food (and contributing to CO2 emissions). Skills and expertise in minimising food waste is largely absent

But there are significant structural barriers to reducing food waste starting with wealth (diminishes concern over food waste and active prevention), desire for food variety, preference for deciding at the last minute on the next meal, complex and unpredictable households, lack of time to devote to considering food waste, poor access to shops, meal components come in large sizes that mean ingredients are left over and often wasted etc

The cornerstone of overcoming persistent food waste is a desire to see it reduced:

- This desire is latent in society because only a minority are prepared to accept the tag of being a "waster". It is socially unacceptable.
- However most do not recognise they currently waste substantial amounts of food and that
 this comes at a significant cost. Wanting to change needs awareness (quantity and value),
 the cost to the environment and reminding people waste is unacceptable

4.2. Evidence for developing the model of change

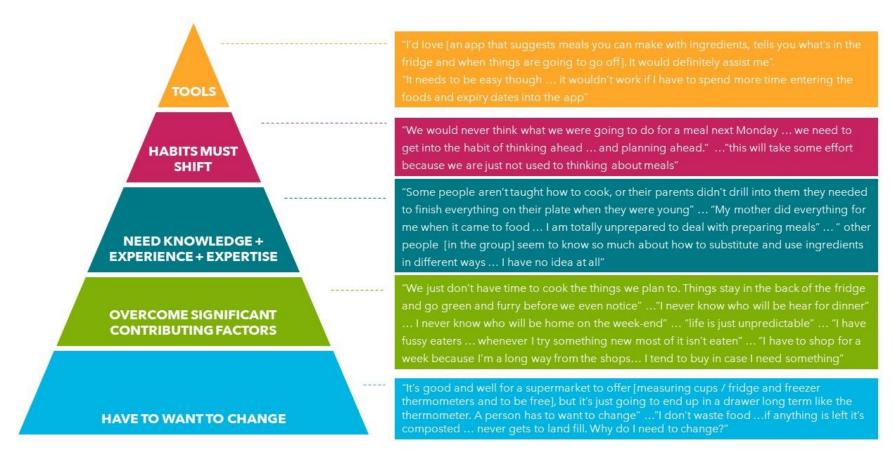


Figure 37: Evidence for developing the model of change to reduce food waste

4.3. Facilitating changing behaviours

Once motivated, it's about facilitating changing behaviours.

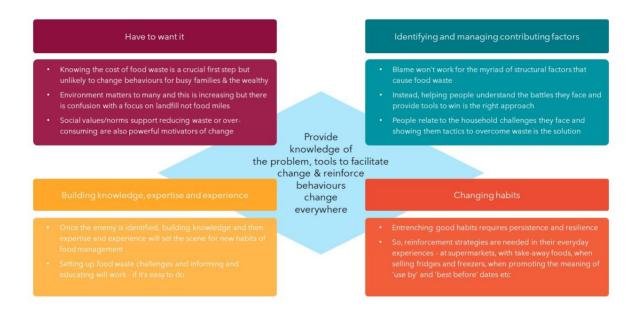


Figure 38: Facilitating changing behaviours to reduce food waste

4.4. Household types and implications for food waste

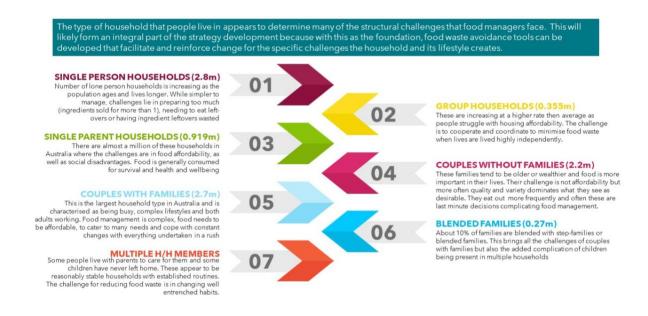


Figure 39: Household types and implications for food waste

4.5. Challenges for sustained behaviour change from the focus groups

In comparison to the survey findings (refer "Survey findings of behaviours and perceived food waste"), similar challenges for sustained behaviour change were derived from the focus groups.

KNOWLEDGE NEEDED

- Lack of knowledge of cooking
- Lack of knowledge about food storage

- Lack of knowledge of when food is unsafe to eat
 Lack of storage containers and knowing how and why to label
 Lack of knowledge that food waste causes CO2 emissions, and wastage of water
 No understanding of food miles vs composting and the
 Portion control (trying to cook and serve what is going to be eaten)
 Serve yourself meals rather than being served -'plating up'
 Write a shopping list and only buy what is on it
 Don't shop when hungry
 Food preparation skills and cooking skills that allow people to use cooked leftovers
- respective impacts on carbon emissions

ATTITUDES TO ALTER

- Throw food out rather than risk eating something past the best
 Innovation / lack of creativity with leftovers by date without any inspection
- Don't buy food just in case
- Encourage people to finish their meal

SKILLS & HABITS TO ENCOURAGE

- Checking what food is in the fridge
- Food rotation system for keeping oldest food at the front to be consumed first

- and ingredients 3-4 ways to use this ingredient until it is used up
- Food combining- knowing which ingredients/quantities can pair together for a low risk outcome
- Only cook planned meals
- Try to minimise last minute change of plans (and if you do, create a plan for using Won't freeze food so need to encourage freezing
 Won't eat leftovers so need to encourage eating leftovers

 Thou food out of the state of the state

 - Plan for "what if' changes to household meal plans.
 - Fridge/freezer cleaning habits for optimal fridge/freezer function
 - Fridge organisation e.g. food labelling, rectangular glass dishes with flat lids for stacking, avoid round dishes that take up more room



Figure 40: Challenges for sustained behaviour change from the focus groups

5. Direction for future research

Key points on knowledge and expertise gaps 5.1

Future research is required to quantify the prevalence of these issues.

Composting seen as virtuous

- Few, if any, of the participants recognised that production, distribution and marketing of food
- They are focused on reducing land fill believing this to be the environmental challenge of food
- · So composting, providing food to animals and miss the key environmental point.

- · Many people lack a repertoire of meals made up from leftover food (e.g. soup, casseroles, savoury mince, 'bubble and squeak', and even pizza) using anything and everything left in the fridge the day before shopping.
- When discussed, most people say they had never thought of these, or didn't know what they could or couldn't put in these meals.

- Remains problematic for many with many unclear about the meaning.
- The over-riding concern is to avoid any risk of getting sick and so most err on the side of caution and dispose of food.
- This issue is more than education on the meaning (although this is needed). Food managers need strategies as to how to use food safely that is on the cusp of the date.

- Many people are proud of their preference for preparing interesting and exotic meals from fresh foods. This often means using small amounts of different foods (e.g. 1/4 cup of cream, 1/2 cup buttermilk, 1/2 yellow capsicum) resulting in leftover foods.
- This means educating people on the environmental impact of their purchasing behaviour AND planning their use of leftovers.

- The qualitative work reveals that the skill and discipline of rotating food (oldest to the front and freshest to the back) is likely not practiced
- Making food rotation an important task, to do on a regular basis, would achieve two goals (1) helping householders identify what is already in the fridge and (2) minimising the risk that food reaches its best by and use by dates.

- The groups consistently saw a strong denials of being a waster of food.
- This was true even for those known to be above average food wasters. While this is partly driven by the desire to be seen as behaving in a socially acceptable manner some is also a clear lack of knowledge.
- This is a crucial issue because without knowing there is a problem there is no need to go looking for a solution.

Figure 41: Future research

6. Conclusions

Challenges for sustained behaviour change from the qualitative research.

KNOWLEDGE NEEDED

- Lack of knowledge of cooking
- Lack of knowledge about food storage
- Lack of knowledge of when food is unsafe to eat
- Lack of storage containers and knowing how and why to label Lack of knowledge that food waste causes CO2 emissions, and wastage of water
- No understanding of food miles vs composting and the respective impacts on carbon emissions

ATTITUDES TO ALTER

- Consciously trying to avoid food waste
- Won't freeze food so need to encourage freezing Won't eat leftovers so need to encourage eating leftovers
- Throw food out rather than risk eating something past the best by date without any inspection
- Don't buy food just in case
- Encourage people to finish their meal

SKILLS & HABITS TO ENCOURAGE

- Checking what food is in the fridge
- Food rotation system for keeping oldest food at the front to be consumed first
- Portion control (trying to cook and serve what is going to be eaten)
- Serve yourself meals rather than being served -'plating up'
- Write a shopping list and only buy what is on it
- Don't shop when hungry
- Food preparation skills and cooking skills that allow people to use cooked leftovers and ingredients - 3-4 ways to use this ingredient until it is used up
- Food combining- knowing which ingredients/quantities can pair together for a low risk outcome
- Only cook planned meals
- Try to minimise last minute change of plans (and if you do, create a plan for using the food)
- Learn how to estimate amount of fresh food required for foods that shrink when cooked
- Innovation / lack of creativity with leftovers
- Plan for "what if' changes to household meal plans.
- Fridge/freezer cleaning habits for optimal fridge/freezer function
- Fridge organisation e.g. food labelling, rectangular glass dishes with flat lids for stacking, avoid round dishes that take up more room

Figure 42: Challenges from sustained behaviour change from the qualitative research

7. Recommendations



1. BROAD STRATEGY

Generate need recognition for changed food management amongst the heavy food wasters of the wealthy, families with children and under 35-year old's

2. FACILITATION

Social norm dictates that food waste avoidance is desirable. Tools, guidance on making structural changes to lifestyle and food management that facilitate positive change are needed

3. REINFOREMENT

Food management is an everyday activities that lends itself to the formation of habits as mental shortcuts reduce demand on the mind's limited thinking power. Once behaviour change is triggered reinforcement strategies using multiple channels are needed to make sure positive behaviours become established

4. EDUCATION

After establishing the value of food waste then build awareness of the environmental impact of food waste, focusing on the carbon emissions spent to grow, distribute and market the food

5. TOOLS AS HABIT CHANGERS

There was extensive support in the focus groups and the choice modelling for tools that help. They want tools that help them achieve their goals (see need states) AND reduce food waste. Where these two align then food waste is likely to be lowered

6.BRANDED INTERVENTIONS

Change strategies need to recognise the emotional needs and develop branded solutions that work to gratify these need states yet deliver better food waste outcomes:

- · Food is planned, prepared and provided my way
- · Food is for us to use to bond and provide for
- · Food needs to make everyone happy
- Food is to be efficiently managed (this is where interventions have focused to date)

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