



Sector Action Plan Summary

2022-2025

# Bread & Bakery



Australian Government  
Department of Climate Change, Energy,  
the Environment and Water



## Executive summary

More than 319,400 tonnes per year (t/yr) of food is wasted across the Australian bread and bakery value chain, from farm to fork. This food waste is equivalent to the weight of 456 million loaves of bread, creating costs for businesses, households, and the environment.

Many organisations in the Bread and Bakery Sector (the Sector) are proactively reducing their food waste. However, individual organisations cannot resolve all issues alone, and a collaborative, system-wide approach is needed.

The Bread and Bakery Sector Action Plan (SAP) was initiated by Stop Food Waste Australia (SFWA) in partnership with the NSW Environment Protection Agency (EPA) and delivered by Rawtec. Sector Action Plans are a key mechanism in helping Australia meet its 2030 target of reducing food waste by half.

Organisations in the Sector codesigned the SAP and applied a systems lens, using the [WRAP UK Whole Chain Efficiency Tool Kit](#). It nominates actions to tackle the root causes of food waste hotspots across the Sector's value chain by:



### Sector Action Plan solutions include:

1. Develop a Better Practice Guide and toolkit for reducing bread and bakery food waste.
2. Develop micro-credentials for reducing bread and bakery food waste in manufacturing.
3. Set up a platform or mechanism for bakeries/retailers to receive updates on technologies/equipment to help reduce food waste.
4. Reduce waste associated with retail 'sale and return' practices by:
  - o Investigating the potential for legislation (like South Australia's) in other jurisdictions to prevent sale and return practices, or
  - o Taking a partnership approach where ownership of waste is shared between the producer and retailer
5. Pilot using point of sales (POS) data to identify the 'sweet spot' between full shelves, the opportunity to maximise sales and limiting food waste.
6. Review nutritional requirements/practices in institutions.
7. Investigate the introduction of legislation in Australian jurisdictions to mandate separate organics collections (like upcoming NSW legislation).
8. Begin/expand production and promotion of smaller loaves.
9. Introduce visual cues on packaging to inform households on how to extend the life of their bread (e.g., freezing the last third of a load of bread before it goes stale).
10. Amplify messaging provided through the potential Nationwide Consumer Behaviour Change Campaign and State/Territory-based campaigns.

The SAP identifies actions, responsibilities, timeframes and KPIs to progress each solution.

Ongoing communication and collaboration across bakery partners and governments will be essential to the success of the SAP. The following actions will support the execution of the plan:

- > Transition the SAP project reference group to a 'food waste working group'. This group will have clear terms of reference and implementation priorities and continue to work collaboratively to tackle food waste.
- > Track process through annual reporting of food waste volumes by bread and bakery organisations.
- > Hold an initial Roundtable with state and territory governments to review the SAP and determine priorities.

Organisations in the Sector are expected to benefit from these actions by:

- > lowering their food waste and associated operational costs
- > reducing Scope 3 supply chain greenhouse gas emissions and other environmental impacts associated with their food waste,
- > demonstrating corporate social responsibility by donating bread and bakery items to food rescue charities and helping consumers to lower food waste in their homes and alleviate cost of living pressures, which may lead to greater brand loyalty, and
- > showing Sector leadership by helping Australia meet its goal of halving food waste by 2030.

## Table of Contents

<b>Executive summary .....</b>	<b>2</b>
<b>Acronyms.....</b>	<b>5</b>
<b>Introduction and background.....</b>	<b>6</b>
About the Sector Action Plan.....	6
Managing food waste and losses.....	8
Food waste account.....	8
Insights by point in the value chain.....	10
<b>Manufacturing.....</b>	<b>11</b>
Hotspots and root causes.....	11
Shortlisted solutions.....	12
<b>Retail.....</b>	<b>14</b>
Hotspots and root causes.....	14
Shortlisted solutions.....	15
Actions.....	15
<b>Foodservice.....</b>	<b>17</b>
Hotspots and root causes.....	17
Shortlisted solutions.....	17
Actions.....	18
<b>Households .....</b>	<b>19</b>
Hotspots and root causes.....	19
Shortlisted solutions.....	19
Actions.....	20
<b>Ongoing engagement.....</b>	<b>21</b>
Actions.....	21
<b>Case studies.....</b>	<b>22</b>
Bakers Delight Smart Shelf Design Prevents Food Waste.....	22
Daily Briefings to Reduce Food Waste at Bob & Pete's.....	23
Equipment upgrades to reduce food waste at Goodman Fielder Australia.....	24
Reducing the impact of food waste at Humble Bakery.....	25
Lowering SKUs to reduce food waste at Phillippa's bakery.....	26
<b>References .....</b>	<b>27</b>
<b>Acknowledgements.....</b>	<b>28</b>
Disclaimer .....	28

## Acronyms

<b>AD</b>	Anaerobic digestion
<b>BAA</b>	Baking Association of Australia
<b>BPG</b>	Better practice guide
<b>GF</b>	Goodman Fielder
<b>KPI</b>	Key performance indicator
<b>POS</b>	Point of sales
<b>NSW EPA</b>	New South Wales Environment Protection Authority
<b>ROI</b>	Return on investment
<b>SA</b>	South Australia
<b>SAP</b>	Sector action plan
<b>SKU</b>	Stock keeping units
<b>SFWA</b>	Stop Food Waste Australia
<b>SOP</b>	Standard operating procedure
<b>WRAP</b>	Waste & Resources Action Programme

## Introduction and background

Organisations in the bread and bakery sector (the sector) are seeking to reduce their food waste and its associated impacts. Wasting food:

- > is costly for businesses and households
- > is a waste of natural resources, including energy, water, fertiliser, and other inputs used to make bakery items that go uneaten, and
- > contributes to greenhouse gas emissions.

### About the Sector Action Plan

The Bread and Bakery Sector Action Plan (SAP) identifies ways to reduce food waste across the value chain for the Sector. The SAP was initiated by Stop Food Waste Australia (SFWA) in partnership with the NSW Environmental Protection Authority (NSW EPA). It was prepared by Rawtec together with project partners, including businesses across the bread and bakery sector and related organisations.

Organisations in the sector are expected to benefit from implementing the SAP by:

- > reducing their production and waste costs
- > lowering Scope 3 supply chain greenhouse gas emissions and other environmental impacts associated with their food waste
- > demonstrating corporate social responsibility by donating food to food rescue charities and helping consumers to reduce their waste and alleviate costs of living pressures, which may lead to greater brand loyalty, and
- > showing leadership by helping Australia to meet its goal of halving food waste by 2030.

SFWA is also working with industries to develop SAPs for other commodities and sectors, including meat, dairy, horticulture, hospitality and foodservice.

### What is the Bread and Bakery Sector?

For the purpose of this project, the 'Bread and Bakery' Sector (the Sector) is defined as the value chain for short-shelf-life baked products that are primarily flour-based or equivalent, such as bread, buns, pastries, cakes, and excludes biscuits or meat pies. The value chain includes primary production, storage (silos), milling, manufacturing (bakeries), retail, and consumers (foodservice and households).

### How was the SAP developed?

The SAP was codesigned with project partners, the Sector and other relevant organisations. Rawtec sought input from these organisations through a series of workshops and consultations. The following steps were taken:

1. Prepare a food waste account to identify volumes and destinations of food materials.
2. Identify food waste hotspots and root causes for why waste is generated.
3. Identify potential solutions that address the root causes of waste.
4. Investigate and validate solutions.
5. Shortlist solutions based on the criteria in Table 1 and in consultation with bakery organisations.
6. Identify how to action solutions (considering the five pillars of SAPs, see Figure 1).

This approach was based on the WRAP's Whole Chain Food Waste Reduction Plan Toolkit<sup>1</sup>.

Table 1: Selection criteria

Category	Criterion	Description
<b>Expected impact on reducing food waste</b>	Food waste volumes	Prioritise solutions that tackle large volumes of food waste. When evaluating performance against this criterion, evaluators considered whether the initiative is likely to reduce overall food waste or just displace the issue (i.e., moving the food waste from one point in the value chain to another).
	Food recovery hierarchy	Prioritise solutions that move waste further up the hierarchy. For example, prioritising measures that ‘prevent’ food waste over initiatives that ‘recycle’ food waste.
	Replicability	Prioritise solutions that are applicable across the wider Sector (rather than an individual organisation).
<b>Potential feasibility within the Australian bread and bakery sector</b>	Technical feasibility	Prioritise solutions that are low-tech and/or have been demonstrated to work elsewhere (rather than bleeding edge technologies).
	Financial feasibility	Prioritise solutions that are likely to result in a positive financial return. Evaluators did not complete a financial analysis on initiatives given project scope/budget limitations. Rather they based their assessments on industry experience with similar initiatives.
	Complexity	Prioritise solutions that are less complex to implement. When evaluating performance against this criterion, evaluators considered the number of stakeholders required to drive the change, alignment with existing policies/legislation, etc. Evaluators also considered complexity within individual organisations to implement solutions given constraints (e.g., staff availability).

Each SAP is comprised of five pillars of activity, as illustrated in Figure 1.



Figure 1: The five pillars of Sector Action Plans (Source: SFWA).

## Managing food waste and losses

The 'Food Recovery Hierarchy' (Figure 2) identifies ways to manage potential food waste and loss. The hierarchy recognises the inherent value of food and the most resource-efficient and environmentally sound approaches to managing it, including:

Waste prevention is best. This includes reducing consumer waste, reducing raw materials waste, repurposing and upcycling materials into new products, and food rescue and redistribution to people in need.

Waste prevention also includes repurposing food waste into animal feed. However, this option is less desirable than other prevention measures, given it is more efficient to feed animals raw ingredients (i.e., grain) than to feed them bakery products (given the latter requires more energy and resources).

The next best after prevention is recycling and options include co/anaerobic digestion (AD), composting, applying to land and leaving unharvested material in-situ, and controlled combustion with energy recovery.

The least desirable options are disposing of waste to landfill, sewer, or refuse and should be avoided where possible.

Material going to recycling, recovery or disposal (the interventions below prevention) is considered food waste and loss. While activities like AD and composting are valuable, they do not contribute towards Australia's target to halve food waste by 2030.

### Bread and bakery-specific food recovery hierarchy

Food and drink material hierarchy:

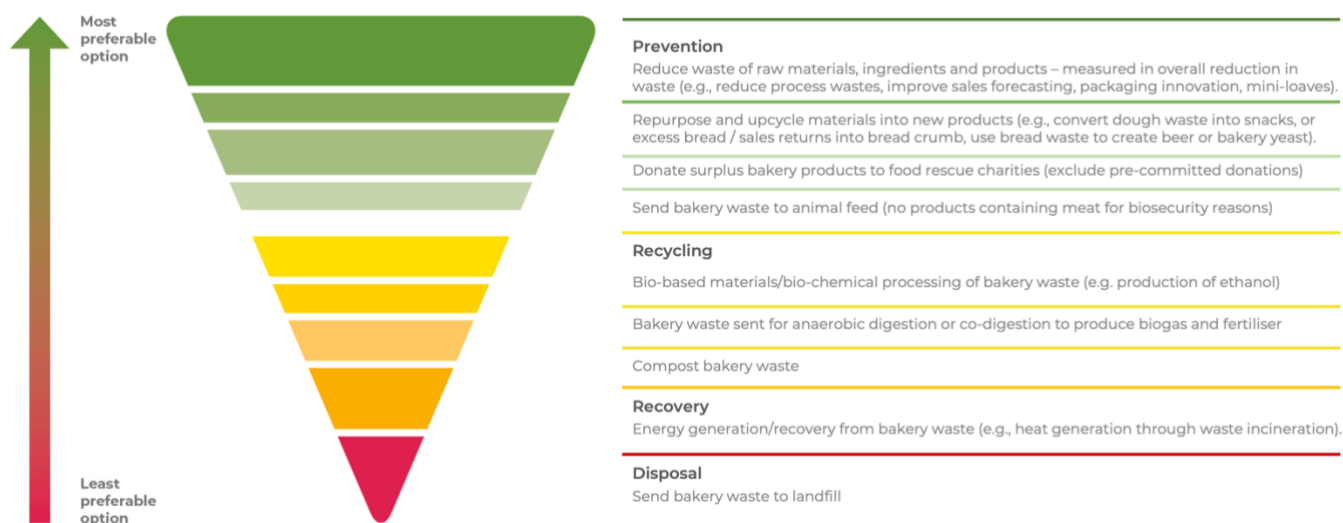


Figure 2: Food recovery hierarchy (source: SFWA).

## Food waste account

The food waste account was prepared based on the National Food Waste Strategy Feasibility Study (FIAL, 2021) and refined using insights from organisations in the Sector. An estimated 575,000 tonnes per year (t/yr) of potential food waste and loss is managed across the bread and bakery value chain (Table 2). The Sector is already preventing close to half of this material from becoming waste, an estimated 255,700 t/yr (44%), by:

- > Feeding food materials to animals (40%)
- > Upcycling surplus products (3%), and
- > Donating to food rescue charities (2%)<sup>1</sup>.

The remaining 319,400 t/yr (56%) is the actual food waste for the Sector, from farm gate to consumer, the equivalent weight of 456 million loaves of bread. Food waste from the Sector is disposed of by:

- > Composting or spread on land (5%), or
- > Landfilled (51%).



		Primary production	Silo	Milling	Bakery	Retail	Households	Foodservice	TOTAL
<b>Prevention</b>									
Upcycle/ repurpose	%	-	-	9%	-	4%	-	-	3%
	t/yr	-	-	12,200	-	3,800	-	-	16,000
Donation to charities	%	-	-	-	7%	8%	-	-	2%
	t/yr	-	-	-	3,700	7,900	-	-	11,600
Animal feed	%	See footnote <sup>3</sup>	-	90%	36%	60%	12%	-	40%
	t/yr	-	-	121,500 <sup>4</sup>	18,100	62,800	25,700	-	228,100
<b>Recycling</b>									
Composting	%	-	-	-	-	6%	6%	1%	3%
	t/yr	-	-	-	-	5,900	13,400	800	20,100
Spread on land	%	100%	-	-	-	-	-	-	1%
	t/yr	7,000	-	-	-	-	-	-	7,000
<b>Disposal</b>									
Landfill	%	-	100%	1%	57%	23%	82%	99%	51%
	t/yr	-	5,000	1,400	28,300	23,500	180,900	53,200	292,300
<b>Totals</b>									
Prevention activities	%	0%	0%	99%	44%	72%	12%	0%	44%
	t/yr	-	-	133,700	21,800	74,500	25,700	-	255,700
Actual food waste and loss	%	100%	100%	1%	57%	28%	88%	100%	56%
	t/yr	7,000	5,000	1,400	28,300	29,400	194,300	54,000	319,400
All materials	t/yr	7,000	5,000	135,000	50,000	104,000	220,000	54,000	575,000

## Insights by point in the value chain

Food waste is generated at each point of the Sector's value chain (Table 2, Figure 3):

- > **Primary production:** An estimated 7,000 t/yr of grain<sup>4</sup> is wasted in primary production (that would have otherwise gone to the bread and bakery value chain). This includes losses due to adverse weather and 'out-of-spec' grain that is severely damaged and/or toxic and not suitable as food. The amount of grain damaged at this point is highly dependent on seasonal conditions.
- > **Storage:** A low amount of waste is generated in silos (5,000 t/yr)<sup>4</sup>. Australia has a sophisticated centralised grain storage system and a high standard of on-farm storage.
- > **Milling:** Millrun is a by-product of processing wheat grain (135,000 t/yr)<sup>5</sup>. It typically makes up 15-20% of product. Most of this material is directed to animal feed or upcycled into products (e.g., cereal bran).
- > **Bakery:** An estimated 50,000 t/yr of potential food waste and loss is generated across bakery/manufacturing. Much of this material (44%) is prevented from becoming waste by being sent to animal feed (18,100 t/yr) or donated to food rescue charities (3,700 t/yr)<sup>6</sup>. The rest (28,300 t/yr) is sent to waste destinations.
- > **Retail:** An estimated 104,000 t/yr of potential food waste and loss is generated across retail. Most of this material (72%) is prevented from becoming waste by being sent to animal feed (62,800 t/yr) or donated to charities to feed people (7,900 t/yr). The rest (29,400 t/yr) is sent to waste destinations.
- > **Households:** generate high volumes of potential bread and bakery food loss and waste (220,000 t/yr). A small proportion of this material is prevented from becoming waste by feeding it to pets (25,700 t/yr). Most of it is sent to waste destinations (194,300 t/yr).
- > **Foodservice:** Organisations providing foodservice generate 54,000 t/yr of food waste and loss. This includes restaurants, cafes, hospitals, aged care, prisons, and other organisations providing foodservice.

There are already a range of food waste prevention activities across the Sector. This SAP focuses on the opportunities to further improve food waste reduction, by reviewing operational procedures, product design and accurate forecasting – particularly across manufacturing (bakeries), retail, households, and foodservice. With 40% of food waste in the Sector currently prevented by sending to animal feed there are also opportunities to move it further up the hierarchy (e.g., feeding it to humans rather than diverting it to animal feed).

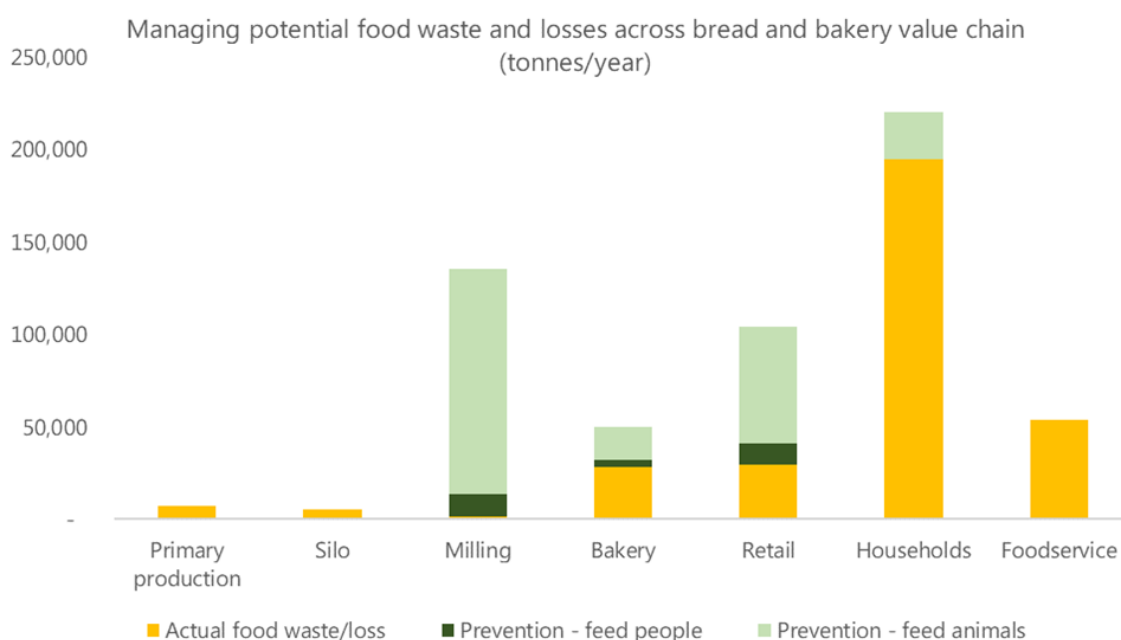


Figure 3: Managing potential food waste and losses across bread and bakery value chain.

# Manufacturing

## Hotspots and root causes

An estimated 50,000 t/yr of food materials in manufacturing in the Sector is either wasted or diverted to animal feed. Hotspots in manufacturing relate to machine failure, human error, and overproduction.

### Machine failure

Machine failure, such as oven breakdowns, leads to food being wasted or diverted to animal feed. The root causes of machine failure include:

- > A lack of discipline prioritising scheduled maintenance.
- > The value proposition for upgrading equipment doesn't exist or isn't recognised.

### Human error

Human error, such as incorrectly weighing ingredients or missing ingredients, contributes to food being wasted or diverted to animal feed. The root causes of human error include:

- > A lack of systems or processes: This is particularly the case for smaller bakeries, which may not have documented recipes and processes.
- > A lack of staff skills and experience: Bakers sometimes need to adjust recipes/processes in response to changing conditions, such as specifications of flour, weather, etc. Some bakers lack skills and/or experience to adjust when needed, resulting in off-specification products.

### Overproduction

Overproduction due to inaccurate forecasting, minimum bake sizes and other reasons leads to food being wasted or diverted to animal feed. The root causes of overproduction include:

- > Consumer expectations for bread baked daily.
- > A lack of data and systems to aid forecasting.
- > A large number of stock keeping units (SKUs), which makes forecasting more difficult.
- > Failure to follow production planning processes or algorithms developed with specific store demand requirements.



**Lowering SKUs at Phillipa's bakery (Vic)**

Product diversity can contribute to food waste. In 2020, Phillipa's Bakery consolidated its product range. The company reduced its range of lower selling Christmas stock keeping units (SKUs), cutting 14 lines (out of 34 SKUs). This reduced food wastage from \$60,000 per quarter down to \$18,000 and profitability increased by about 5%. This includes savings in labour, ingredients, and packaging cost. Further benefits of reducing product diversity include simplifying production processes and lowering pressures on bakery production staff.

## Shortlisted solutions

Solution	Description
<b>Develop a Better Practice Guide (BPG) and toolkit for reducing bread and bakery food waste (A1)</b>	<p>BPG and toolkit to include guidance on:</p> <ul style="list-style-type: none"> <li>&gt; Preventative maintenance, including what constitutes best-practice, and a calculator tool on return on investment (ROI) for equipment upgrades.</li> <li>&gt; Initiatives to help reduce waste due to human error (e.g., guidance on standard operating procedures (SOPs), using prover retarders, etc).</li> <li>&gt; Initiatives to reduce overproduction (e.g., ensuring point of sale (POS) reports are fit for purpose to aid forecasting and production planning, repurposing items, reducing number of SKUs, etc).</li> </ul>
<b>Micro-credentials for reducing food waste in bakeries (A2)</b>	<p>Micro-credentials are small, certification-style courses that upskill employees, without the time and cost commitment of a full course. These credentials would be targeted towards those working in the bakery industry and cover similar topics as the BPG. This could be developed in partnership with an education partner and delivered online.</p>
<b>A platform or mechanism for sharing technology updates and suppliers that help reduce food waste (M1)</b>	<p>A platform or mechanism for sharing technology updates and suppliers that help reduce food waste. This includes sharing information on:</p> <ul style="list-style-type: none"> <li>&gt; Software/applications to improve forecasting.</li> <li>&gt; 'Internet of Things'/'Internet of Services' solutions that help to identify and manage food waste issues in manufacturing.</li> <li>&gt; New/updated equipment to reduce food waste in manufacturing.</li> </ul>

Several bakers have already taken the initiative to reduce food materials from being wasted or diverted to animal feed.



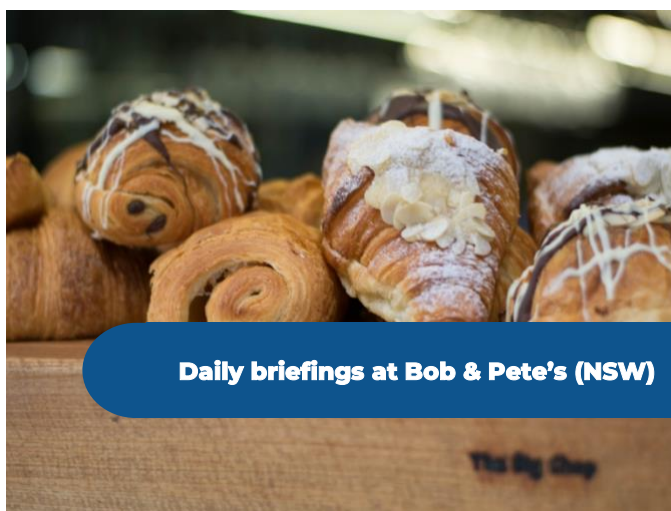
**Equipment upgrades at Goodman Fielder (Aus)**

Goodman Fielder is committed to reducing food waste within its operations. After reviewing waste quantities across their operations, Goodman Fielder introduced initiatives to minimise food waste at their Burleigh Heads bakery in Queensland. Goodman Fielder identified a key cause of food waste in the bakery was bread getting stuck to bread tins. It made a large capital investment to replace bread tins and introduce other initiatives to minimise food waste. For example, the company updated its staff training to minimise the risk of human error and introduced daily operations reviews of waste levels in the factory, allowing employees to better understand their respond to waste issues. These initiatives combined have reduced food waste in their Burleigh Heads bakery by 45%.

## Actions

The table below identifies actions to reduce food waste that occurs in bakeries. Manufacturers can also play a role in reducing downstream food waste. For example, manufacturers can provide visual cues on packaging that prompt consumers to freeze the final third of their bread loaf instead of letting it go stale. Additional actions for manufacturers that influence downstream food waste are included in the sections on foodservice and households.

Solution ID	Action	Pillar	Start by	Responsibility	KPI
A1	<b>Develop and disseminate a Better Practice Guide (BPG) and toolkit for reducing bread and bakery food waste</b>	Building a community of practice	Feb 2023	BAA in partnership with NSW EPA and SFWA	# unique downloads of BPG and Toolkit
A2	<b>Develop and deliver micro-credentials for reducing bread and bakery food waste</b>	Building a community of practice	Feb 2023	BAA in partnership with SFWA	# of micro-credentials awarded
M1	<b>Set up a platform or mechanism for sharing updates on technology (and suppliers) to reduce food waste</b>	Building a community of practice	Nov 2022	SFWA in partnership with BAA	# bakery organisations participating in platform/forum



### Daily briefings at Bob & Pete's (NSW)

Bob and Pete's identified an opportunity to reduce bakery waste by communicating waste to production staff and involving them in the waste minimisation problem solving process. The company began including loss value of waste in their daily briefings. The process isn't about pointing fingers, rather identifying systemic issues that can be improved together. The initiative has increased staff knowledge of waste and is used to gain insights from staff on opportunities to reduce waste. As a result, it has lowered the operation's waste by 6.5% since commencing (estimated at almost 4 tonnes per year).

# Retail

## Hotspots and root causes

An estimated 104,000 t/yr of bakery food materials in retail is either wasted or diverted to animal feed. A major hotspot in retail is unsold bread.

### Unsold bread

The root causes of unsold bread include:

- > Manufacturers are required to take back and deal with unsold product in retail. This practice occurs in all states/territories, except South Australia where legislation restricts the activity (see box below).
- > The markup on a loaf of bread (or similar item) is high, and hence the sale of another loaf can outweigh the cost of wasting several loaves.
- > Manufacturers oversupplying retailer shelves when chasing sales volume.
- > Consumers' expectation for shelves to be well stocked with a large range of SKUs until store close.

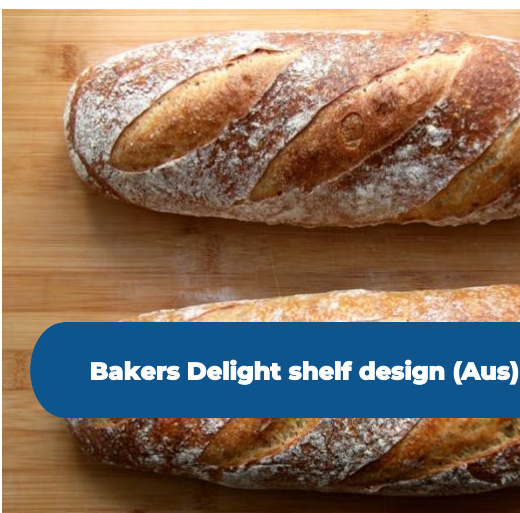
#### Box 1 Sale and return

##### Sale and return

Sale and return is a practice which allows retailers of bread to return unsold product to the manufacturer and receive a refund. Sale and return is allowed in all states and territories of Australia except South Australia (SA).

In SA, regulations under The Prices Act 1948 restrict the practice of sale and return of bread. The regulations were introduced to address practices in the baking industry that were resulting in large scale wastage of bread and threatening the survival of small bakeries. They affect the market for the sale and supply of bread in SA at both a wholesale and a retail level (OCBA, 1999).

Such regulations do not exist outside of SA, so sale and return is common practice across other states and territories. In these jurisdictions, an estimated 12-20% of bread and bakery items are returned to manufacturers (based on this project's findings). This compares to an estimated 2-6% of unsold proprietary bread in SA (OCBA, 1999).



**Bakers Delight shelf design (Aus)**

Bakers Delight has tested innovative shelving units to prevent food waste and reduce costs. An important consideration for shelf design is to look full throughout the day (to appeal to consumer preferences) while minimising wastage at closing time. The solution trialled was collapsible shelving units. Once stock is purchased and the units start to clear, the shelves can be collapsed. The collapsed shelves display a nice image to maintain aesthetics and not give customers the perception of empty shelves. This means the shop does not need to bake as much bread to keep their shelves full, reducing unsold bread and associated waste. Each collapsible shelving unit is estimated to save around 5 tonnes of bread per year, worth an estimated \$5000.

## Shortlisted solutions

Solution	Description
<b>Investigate the potential for introducing legislative mechanisms (like SA's) in other jurisdictions to prevent sale and return practices (R1)</b>	Legislative mechanisms (like SA's) are introduced in other jurisdictions to prevent sale and return practices, and thus lower the amount of food being wasted or diverted to animal feed. See Box 1.
<b>Partnership approach: the ownership of waste is shared between producer and retailer (R2)</b>	In the absence of legislative mechanisms or while waiting for it to commence, partnerships could be formed between manufacturers and retailers to share the ownership of unsold bread. Outside of SA, manufacturers are responsible for managing waste from retailers. If the ownership of waste is shared, reducing waste becomes the interest of both parties.
<b>Pilot using point of sales (POS) data to identify the 'sweet spot' between full shelves, the opportunity to maximise sales and limiting the amount of bakery products going to waste (R3)</b>	A pilot using point of sales (POS) data to investigate consumer behaviour related to shelf fullness. Understanding this would allow retailers to maximise profitability while minimising waste.
<b>Investigate introducing legislation mandating separate organics collections, like upcoming NSW legislation (R4)</b>	<p>Many smaller retailers are part of a shopping centre complex that control the contracts for waste and recycling services. These complexes may not have organics recycling services, and hence food waste from bakeries is often landfilled rather than sent for higher value uses (like compost).</p> <p>Legislating a separate organics collection will reduce organic waste in landfill and allow for bakeries and other retailers operating in large shopping complexes to gain access to an organics service.</p>
<b>Develop BPG and toolkit for reducing food waste (A1)</b>	The BPG and toolkit for reducing bread and bakery waste to include a section for retailers on good practise for reducing food waste/loss (e.g., clustered ranging), educating about the 'real cost of waste' and a tool to help calculate true costs of waste (including labour, materials, waste costs, environmental costs, etc).

## Actions

Developing a BPG and toolkit can help tackle food waste across multiple points of the Sector. An action for progressing developing the guide can be found in 'manufacturing'.

Solution	Action	Pillar	Start by	Responsibility	Measure of success
R1	<b>Roundtable with state/territory jurisdictions on potential changes in legislative mechanisms to prevent sale and return practices</b>	Policy levers	Oct 2022	SFWA	Agreed next steps on progressing this initiative

R3	<b>Design and run a pilot with a participating retailer on the impact of shelf fullness on product sales (using POS data)</b>	Research, Development, & Extension	Feb 2023	Participating retailer	Completion of pilot and disseminate findings
A1	<b>Work with relevant state/territory jurisdictions to incorporate 'true cost' of waste methodology/tool (from BPG and toolkit) into waste prevention programs</b>	Implementation	Upon release of BPG and Toolkit	NSW EPA and other jurisdictions	# of jurisdictions with food waste prevention programs for retailers to manage bread and bakery waste
R4	<b>Dialogue with state/territory jurisdictions (except NSW) to highlight the lack of access to organics recycling services in shopping precincts and the need for policy interventions</b>	Policy Levers	Nov 2022	SFWA with partner jurisdictions	Commitment from jurisdictions for ongoing work with the business sector to address this issue



# Foodservice

## Hotspots and root causes

An estimated 54,000 t/yr of bakery food materials in foodservice is either wasted or diverted to animal feed. These volumes include foodservice activities across restaurants, cafes, aged care facilities, correctional centres, hospitals, and other facilities. A major hotspot in foodservice is plate waste, i.e., people not eating/finishing the bread they are served.

### Plate waste/Portion sizes too big

A root cause behind this hotspot is that bread is often used in menu design as a 'filler', as a side dish or in a bread basket to satisfy customers' expectations for value for money, and is subsequently wasted.

## Shortlisted solutions

Solution	Description
<b>Develop BPG and toolkit for reducing food waste (A1)</b>	<p>BPG and toolkit for reducing bread and bakery waste. This Guide to include a section for foodservice providing guidance on:</p> <ul style="list-style-type: none"> <li>&gt; understanding the true cost of waste.</li> <li>&gt; doing an audit on bread and bakery waste to identify how much and why the waste is generated.</li> <li>&gt; reviewing the menu, considering cultural preferences, dietary requirements, portion sizes and other considerations.</li> <li>&gt; asking customers if they wish to have bread on the side or how much</li> <li>&gt; upcycling and valorising unused bread (e.g. croutons, breadcrumbs, garlic bread etc.).</li> <li>&gt; making them aware of apps to sell at a discount rate or giveaway surplus bread and bakery items for commercial opportunities and food donation.</li> <li>&gt; offering takeaway container to take food home to enjoy later.</li> </ul>
<b>Review nutritional requirements/practices in institutions (F1)</b>	<p>Bread waste arises in institutions due to poor menu design and over-specifying the amount of carbohydrate content. This solution involves reviewing the amount of carbohydrates served daily versus how much bread is offered. The BPG can be followed for practical guidance on how to address food waste.</p>



The Hilton Hotel Sydney participated in the NSW EPA Your Business is Food Program. Through this program the company reviewed its food waste generation. The hotel wasted an estimated 120 tonnes of food per year. 40% of this material was plate waste (i.e., food served to customers that went uneaten). The hotel did food waste audits, and found high volumes of carbohydrates (e.g., bread, buns, etc) were going uneaten. As a result, the hotel reduced its carbohydrate portions from 80g to 60g per person. Through the program, the hotel halved its food waste, and saved almost \$860,000 in 2018-19. Source: (NSW EPA, 2022).

## Actions

Developing a BPG and toolkit can help tackle food waste across multiple points of the Sector. An action for progressing developing the guide can be found in 'manufacturing'.

SFWA is working with industries to develop SAPs for other commodities and sectors. There is potential for this SAP to crossover with plans being developed for institutions, hospitality, and foodservice. Coordination is needed to manage these potential crossovers.

Solution	Action	Pillar	Start by	Responsibility	Measure of success
A1	Disseminate BPG and toolkit to foodservice companies	Building a community of practice	Upon publishing of guide	BAA, NSW EPA, SFWA, interested bakery partners	# unique downloads of BPG and Toolkit
FI	Establish a dialogue with relevant departments/organisations that run institutions to make them aware of bread waste, highlighting how this can be tackled and the benefits of doing so (including reference to the BPG to provide more context and guidance)	Building a community of practice	Upon publishing of guide	SFWA	Information/methods from BPG and toolkit incorporated into state/territory waste prevention programs
NA	Coordinate with other SAP leads relating to actions on reducing bread and bakery waste across institutions, foodservice and hospitality.	MERI	Ongoing	SFWA	SAPs are complementary, and there are clear divisions of responsibility for common actions/solutions

# Households

## Hotspots and root causes

An estimated 220,000 t/yr of bread and bakery items go uneaten in households across Australia each year. A Fight Food Waste CRC study determined the root causes for bread and bakery waste in households, which include:

- > desire for freshness
- > poor storage practices at home
- > high shopping frequency/top up shopping, and
- > just-in-case buying (Karunasena, Pearson, & Fight Food Waste CRC, 2021).

## Shortlisted solutions

Solution	Description
<b>Begin/expand production and promotion of smaller loaves (H1)</b>	Smaller loaves would serve as a solution in reducing waste for households who want fresh bread each day and are unwilling to store bread in the freezer.
<b>Introduce visual cues on packaging to inform households on how to extend the life of their bread (H2)</b>	Packaging to include information for best storage practices (store in the freezer to extend life, do not store in the fridge, store in a cool and dry place away from direct sunlight etc.). Could include a 'freeze from here' line for the bottom third of the loaf before it goes stale.
<b>Amplify messaging provided through potential Nationwide Consumer Behaviour Change Campaigns and State/Territory-based campaigns (H3)</b>	<p>SFWA is seeking to roll out a nationwide behaviour change campaign on reducing household food waste. Some state and territory governments are also developing campaigns to reduce bread and bakery waste.</p> <p>The Sector could help amplify any relevant messages from campaigns. For example, by sharing bread and bakery waste reduction tips on their social media channels.</p> <p>State and territory governments could also ensure that these messages are incorporated into their waste prevention programs to amplify messages.</p>



**Packaging to promote freezing bread in the UK**

The UK wastes 900,000 tonnes of bread every year. 28% of this bread is wasted in homes (WRAP, 2021). Storing bread in the freezer prolongs bread and helps prevent waste. UK bread manufacturers have changed their packaging to advise their people to freeze their bread.

Packaging uses strong visual cues, such as bread texture, to reinforce perception of freshness. The label 'chunks' the loaf into two sections, 'hero-ing' the final quarters as the bit to store in the freezer. The packaging implies that freezing bread is both a normal storage option and a natural/desired behaviour. Source: WRAP Behavioural Innovation Lab (2019).

## Actions

Solution	Action	Pillar	Start by	Responsibility	Measure of success
H1	Begin/expand production and promotion of smaller loaves	Implementation	Feb 2023	Bread manufacturers and retailers	Number of SKUs with smaller loaf sizes available
H2	Run a pilot to test the impact of visual cues on bread bags to freeze the end of a loaf to reduce food waste.	Implementation	Jun 2023	Packaged bread and bakery product manufacturers/ AIP	Identify visual cues on packaging that are effective at reducing household food waste
H3	Amplify relevant messaging provided through Nationwide Consumer Behaviour Change Campaign/State-based campaigns.	Implementation	Upon campaign release	All project partners	# of organisation in Sector that are amplifying messages
H3	Integrate bread and bakery waste saving messaging and education into existing food waste education programs	Implementation	Nov 2022	NSW EPA and other relevant state/territory government agencies and Non government organisations (NGOs).	# of state/jurisdictions that have included bread and bakery food waste reduction messaging into existing education programs

## Ongoing engagement

Developing the SAP provided a unique opportunity for the Sector to come together and discuss food waste issues and solutions. Ongoing communication and collaboration across bakery partners and governments is essential for the success of the SAP.

### Actions

Solution	Action	Pillar	Start by	Responsibility	Measure of success
E1	Transition SAP project reference group to a 'food waste working group'. This group to have clear terms of reference, implementation priorities and continue to work collaboratively to tackle food waste.	MERI	Nov 2022	SFWA, in collaboration with BAA and the Sector	# of organisations involved in meetings
E2	Annual reporting of food waste volumes by bread and bakery organisations to track progress on reducing food waste	MERI	July 2023 (annual reporting)	Food waste working group/ SFWA	# of organisations reporting data on food waste
E3	Hold an initial Roundtable with State and Territory governments to review the SAP and determine priorities.	MERI	Feb 2023	SFWA	Actions prioritised for state/territory implementation

## Case studies

### Bakers Delight Smart Shelf Design Prevents Food Waste



Consumer preferences for full shelves contribute to food waste across the industry. In the short shelf-life product industry, shelves are kept full to maximise product sales. This can lead to overproduction, as retailers are motivated to keep their shelves full until the end of the day, so customers can buy products near closing time. Product is therefore made to fill the shelves and then disposed when unsold.

Bakers Delight trialled an innovative solution and new smart shelving units to prevent food waste and reduce costs, while appealing to consumer preferences.

The company is an Australian-owned multinational bakery franchise chain, with over 700 bakeries in Australia, New Zealand, Canada and the United States.

The idea to introduce the new shelving units began in 2020, in the face of COVID-19. Customers were keen to quickly get in and out of shops to minimise their risk of being exposed to the virus. Bakers Delight introduced shelves in the customer area to allow customers to select their products more quickly (rather than waiting for a service person). An important consideration for the design of these shelves was to look full throughout the day (to appeal to consumer preferences) while minimising wastage at closing time. The solution involved trialling collapsible shelving units.

The shelving units sit adjacent the front counter and hold stock that customers can collect as they enter the shop. Once the stock is purchased and the units start to clear, the shelves can be collapsed. The collapsed shelves display a nice image to maintain aesthetics and not give the perception of empty shelves to customers. The shelves are modular and can be collapsed gradually as product reduces. This means the shop does not need to bake as much bread to keep their shelves full, reducing overproduction and associated waste.

Each collapsible shelf is estimated to save around 5 tonnes of bread per year, worth an estimated \$5000.

The trial is complete and Bakers Delight has demonstrated the business case for the shelving units. Most units are installed when a bakery is refurbished as they can more easily be built into the bakery design at this time, increasing sales while not leading to overproduction as a traditional shelf would.



Images: collapsible shelving unit with shelves open (left), fully collapsed (middle), and bottom two shelves stocked with product (right).

## Daily Briefings to Reduce Food Waste at Bob & Pete's



In a fast-paced environment, considering wastage for the day and opportunities to reduce this wastage is often missed.

Reporting value loss at daily briefings provides the opportunity to stop, reflect and improve processes.

Bob & Pete's have changed how 'waste' is communicated with production staff, resulting in an estimated 6.5% reduction in Operations waste (almost 4 tonnes per year).

Bob & Pete's is a leading supplier to cafés, restaurants, caterers and retailers across New South Wales.

Bob & Pete's does all its baking in-house. Their bread baking process is already lean and produces low amounts of waste. However, there is still waste generated during the baking process. For example, when product does not meet specifications, or batch sizes do not align with the required amounts to make a product.

The company identified an opportunity to reduce bakery waste by communicating waste to production staff and involving them in the waste minimisation problem solving process. They do this through daily briefings on the lost value of waste.

The steps involved are:

1. Each day the cost of waste for the day is estimated. For example, \$100 of ingredients in were wasted.
2. During the daily briefing the operations manager communicates the value loss to production staff.
3. Staff question why this happened and where the lost dollars (waste) was generated. This helps identify where to focus efforts to reduce waste. Staff then work together to find ways to prevent this from repeating.
4. After some time, a 'good day' is easier to identify as there will be less value lost reported.

The process is not intended to point fingers, rather identify systemic issues that can be improved together. The daily briefings increase staff knowledge of waste and can be used to gain insights from staff on opportunities to reduce waste.

By transferring waste to lost dollars for the business, staff can better understand the opportunity to improve practices, and it is easier to see improvement (e.g. one day there was \$1000 lost, today there is only \$300 lost, tomorrow only \$50 etc). Lost dollars is a more relatable metric than lost kilograms, batches, or units.

This initiative is in its early stages. As a next step, Bob and Pete's is considering setting daily waste/value loss targets.



## Equipment upgrades to reduce food waste at Goodman Fielder Australia



Goodman Fielder is committed to reducing food waste within its operations. In 2020, the company achieved a 45% reduction in production waste at their Burleigh Heads bakery.

Goodman Fielder are one of the largest suppliers of bread and grocery items in Australia, selling over 250 million units of bakery products per year. The company makes over 20 brands in Australia including bakery brands Helga's and Wonder.

After reviewing waste quantities across their operations, Goodman Fielder introduced initiatives to minimise food waste at their Burleigh Heads bakery in Queensland. A key cause of food waste in the bakery was bread getting stuck to bread tins. Goodman Fielder made a large capital investment to replace bread tins.

Complementary initiatives introduced to reduce waste included updating staff training to minimise the risk of human error and introducing daily operations reviews of waste levels in the factory, allowing employees to better understand and take action when waste issues arise.

These initiatives combined reduced food waste in their Burleigh Heads bakery by 45%.

Goodman Fielder's waste minimisation efforts extend beyond the operation of their bakeries. Goodman Fielder:

- > convert 1,000 tonnes of unsold bread to breadcrumbs and recover a further 20,000 tonnes of bakery waste for stock-feed annually.
- > partner with Foodbank to donate excess food, donating over one million meals in 2021.
- > have launched a mini-loaf range of bread under their Wonder White and Helga's brands to support consumers to reduce bread waste. Now, more than 4 million mini loaves are sold annually.



Images: Helga's mini-loaf of bread (left).



## Reducing the impact of food waste at Humble Bakery

**HUMBLE** “Once food waste is separated from other waste streams, it becomes visible. Once it is easy to see, it becomes easy to change,” said Sarah Hughes, Pastry Chef, Humble.

Managing food waste is easily overlooked in the day-to-day of a small bakery. The team at Humble bakery have begun separating their food waste for recycling. Doing so has helped them become more aware of food waste volumes, reduce their greenhouse gas emissions, and is the start of a bigger journey to reduce food waste.

Humble is an artisan bakery located in the Sydney suburb of Surry Hills, selling fresh bread and pastries baked daily. The bakery first opened in 2020 and is owned by the same team as adjacent restaurants Porteno, WyNo X Bodega and Bastardo.

As a first step to reducing bakery waste impacts, Humble introduced organics recycling bins. Diverting food waste from landfill has environmental benefits because it avoids greenhouse gas emissions associated with organics breaking down at landfill. Additionally, using recycled organic products (mulch and compost) on farms provides soil health benefits which maintain or improve productivity. Productivity improvements can include more uniform crop growth and reduced need for irrigation water and fertilisers.

Introducing the organics bins was championed by Humble’s pastry chef, Sarah Hughes, who described the process as unexpectedly easy. The bakery and three adjacent restaurants under the same management now have organic waste bins at each workstation. In the first week alone using the organics service, the group successfully diverted 274 kg of organics waste away from landfill, saving greenhouse gas emissions equivalent to 176 kg of CO<sub>2</sub>\*.

There is a perception that in fast-paced work environments, such as bakeries, staff may be reluctant to source separate food waste because they are already stretched meeting other work demands. After a few weeks with the organics service in use, Humble reported that their team has been receptive towards the service and contamination levels are low (estimated to be <5%). The successful introduction was achieved using signage on the bins alongside training and ongoing feedback from Sarah, who continues to monitor the organics bins.

With the organics service operational, Humble will turn its attention towards minimising food waste. The bakery is planning a waste audit to identify where and how food waste occurs, allowing them to consider what is avoidable. This will be followed by a review and update to their systems, including preparation and baking methods, sales forecasting, waste tracking and training.

Humble bakery has successfully reduced the impact of their food waste by redirecting waste from landfill towards organics recycling. The changes to waste management practices have been embraced by staff. They are now looking to minimise waste at the source, further reducing the environmental footprint of the bakery.

\*Estimate based on carbon emission conversion factors published by Green Industries SA in 'SA organics sector analysis Summary' (2021).



## Lowering SKUs to reduce food waste at Phillippa's bakery



Product diversity can contribute to food waste. In 2020, Phillippa's Bakery consolidated its product range, which lowered wastage by 70% and increased profitability by 5%.

"By consolidating our product lines, we have reduced food waste by 70% and increased profitability by 5%," said Andrew O'Hara, General Manager, Phillippa's Bakery

Phillippa's is a premium wholesaler and retail bakery supplying Melbourne's public and retailers since 1994. Amid COVID-19 lockdowns, Phillippa's reviewed its operations and identified ways to reduce wastage. They found that a number of products were underperforming, particularly in their Christmas range. Any unsold products become waste.

Phillippa's reduced their range of lower selling Christmas stock keeping units (SKUs), cutting 14 lines (out of 34 SKUs). This reduced food wastage from \$60,000 per quarter (Sep-Dec 2019) down to \$18,000 (Sep-Dec 2020). This includes savings in labour, ingredients and packaging from no longer producing the lower performing SKUs. As a result, profitability increased by about 5%.

Further benefits of reducing product diversity include simplifying production processes, and lowering pressures on bakery production staff.

Andrew O'Hara, General Manager at Phillippa's encourages other bakeries to review their operations, and look for opportunities to reduce product diversity. He recommends taking a measured approach: "Don't cut half your lines overnight, otherwise you risk damaging your businesses. Experiment with a small number of lines at a time to see the impacts on your businesses before making lasting changes."

This case study demonstrates the benefits of reducing product diversity to lower food waste and deliver further benefits to bakeries.

## References

- FIAL. (2021). The National Food Waste Strategy Feasibility Study – Final Report. Retrieved from <https://workdrive.zohopublic.com.au/external/06152b9ff5971843391f39fc4d32a847e56fb907c167a4a645887b0a4bc43000>
- Karunasena, G. G., Pearson, D., & Fight Food Waste CRC. (2021). Australian household food waste: A summary of behaviours, attitudes, perceived and actual food waste. Retrieved from [https://fightfoodwastecrc.com.au/wp-content/uploads/2021/07/FINAL-summary\\_report.pdf](https://fightfoodwastecrc.com.au/wp-content/uploads/2021/07/FINAL-summary_report.pdf)
- NSW EPA. (2022). Food waste action plan - Hilton Sydney.
- OCBA. (1999). National Competition Policy Review of the Prices Act 1948. Retrieved from [ncc.ncc.gov.au/docs/SA%20review%20of%20the%20Prices%20Act%201948%2C%20Final%20Report%2C](http://ncc.ncc.gov.au/docs/SA%20review%20of%20the%20Prices%20Act%201948%2C%20Final%20Report%2C)
- WRAP. (2021). Food surplus and waste in the UK - key facts. Retrieved from <https://wrap.org.uk/sites/default/files/2021-10/food-%20surplus-and-%20waste-in-the-%20uk-key-facts-oct-21.pdf>
- WRAP. (2022). Action on food waste. Retrieved from <https://wrap.org.uk/taking-action/food-drink/actions/action-on-food-waste>

# Acknowledgements

Stop Food Waste Australia was established with funding from the Australian Government to lead the delivery of the National Food Waste Strategy. Stop Food Waste Australia would like to acknowledge and thank project partners Rawtec and NSW EPA. In particular, we would like to acknowledge the valuable contributions of the Project Advisory Group and industry participants to this Sector Action Plan. This includes (in alphabetical order): Australian Export Grains Innovation Centre, Australian Food and Grocery Council, Australian National University, Bakers Delight, Baking Association of Australia, Bob & Pete's, Central Queensland University, George Weston Foods, Goodman Fielder, Humble Bakery, Phillippa's Bakery, Long Bay Complex (Corrective Services Industries), Stock Feed Manufacturers' Council of Australia, and the Waste & Resources Action Programme (WRAP).

## Disclaimer

This document has been prepared by Rawtec Pty Ltd (Rawtec) for Stop Food Waste Australia. The information contained within this document is based upon sources, experimentation, and methodology which at the time of preparing this document were believed to be reasonably reliable and the accuracy of this information subsequent to this date may not necessarily be valid. This information is not to be relied upon or extrapolated beyond its intended purpose by the client or a third party unless it is confirmed in writing by Rawtec that it is permissible and appropriate to do so.

Unless expressly provided in this document, no part of this document may be reproduced or copied in any form or by any means without the prior written consent of Rawtec or Stop Food Waste Australia.

The information in this document may be confidential and legally privileged. If you are not the intended recipient of this document (or parts thereof), or do not have permission from Rawtec or Stop Food Waste Australia for access to it, please immediately notify Rawtec or Stop Food Waste Australia and destroy the document (or parts thereof).

This document, parts thereof or the information contained therein must not be used in a misleading, deceptive, defamatory or inaccurate manner or in any way that may otherwise be prejudicial to Rawtec, including without limitation, in order to imply that Rawtec has endorsed a particular product or service.

**For further information please contact:**

[enquiries@fightfoodwastecrc.com.au](mailto:enquiries@fightfoodwastecrc.com.au)

or visit [www.stopfoodwaste.com.au](http://www.stopfoodwaste.com.au)



Australian Government  
Department of Climate Change, Energy,  
the Environment and Water

