

2020

# Food Waste Management- Relevant Resources

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## INTRODUCTION

Food waste, which refers to edible food that is lost, uneaten or carelessly discarded, is a major global issue. It has been estimated that internationally, 1.6 billion tonnes of primary product equivalents are wasted, and 80-90% of this (or 1.3 billion tonnes) is edible food waste <sup>1</sup>. This figure represents around one-third of the world's total food production going to waste <sup>2</sup>. The consequences of food waste are multilayered, yet interlinked, and can be dissected into three broad categories; economic, environmental and social.

When considering labour, time and material resources as economic losses, in conjunction with the end product, there is a substantial amount of monetary resources allocated towards producing wasted food. When quantifying this amount of money allocated to the production of discarded edible foods, a staggering 1 trillion USD is estimated for the global resource costs in production, excluding wasted costs associated with the transportation and storage of goods <sup>3</sup>. Mismanagement of the earth's resources that are needed for producing food and inefficient consumption patterns also equates to around 28% of agricultural land use that ultimately produces wasted food.

The flow-on social impacts of food waste hit hard, especially for those with a lower socioeconomic status. In both the global north and the south food wastage inflates food prices, making it inaccessible to many. Generally, in the global south, many developing nations struggle with food wastage of up to 40% of all produce in the earlier stages of the food life cycle, often due to inadequate post-harvest storage and transportation technology<sup>4</sup>. This amount of wasted food in developing countries is valued up to 310 billion USD a year <sup>5</sup>. In contrast, most of the food waste in the global north, which values up to 680 billion USD, originates from the latter stages of the food supply chain. Contributing factors include over-purchasing of food items as well as the exclusion of certain food items at the purchasing stage due to societal 'quality' norms that overemphasise the importance of the appearance of fresh produce <sup>6</sup>. In both cases, supply issues inflate the prices of produce in order to recover some of the hidden costs. This supply and demand equation push prices to a point where it is unattainable for some managing lower incomes. If one-fourth of the produce that is wasted annually could be recovered, there would be enough food to nourish everyone on earth, with specific emphasis on the 870 million people globally, roughly one in every eight people, who suffer from hunger and poverty <sup>7</sup>.

From an environmental standpoint, if food waste were to be significantly decreased or eliminated, greenhouse gas (GHG) emissions would reduce by approximately 2.3 million tons. This amount of GHGs equates to 11% of emissions related to food which is almost equivalent to the emissions generated from global transport <sup>8</sup>. These GHG emissions accelerate anthropogenic climate change, exacerbating the multitude of flow on impacts such as global warming, sea-level rise, acidification of seas, loss of biodiversity, more frequent extreme weather events and so on <sup>9</sup>.

Aside from GHG emissions, food waste impacts the environment via the process of land-use change. Only a low percentage of wasted food is composted, and the majority of food refuse is sent to landfill <sup>10</sup>. The result is that more land than necessary is converted to landfill to hold food waste. Secondly, 1.4 billion hectares of land is dedicated to producing food that is eventually wasted <sup>11</sup>. Both these unnecessary uses of land have severe impacts on biodiversity. Currently, the earth is emerging into what could be the sixth mass extinction, the Holocene extinction crisis, with over a million species threatened to extinction with habitat loss. Environmental change and overexploitation of biodiversity are some of the leading causes, which are and will only continue to be magnified with ongoing food wastage <sup>12</sup>.

Although these issues can appear independent of one another, the combined economic, environmental and social impacts can have an exponential effect as a consequence of food waste. Environmental issues of food waste, in particular, can act as a vicious cycle and place a magnified impact on the social, economic and even further environmental downsides of food waste. As aforementioned, climate change is being rapidly accelerated by food waste by emitting carbon dioxide, methane, nitrous oxide and hydrofluorocarbons at a rate of 2.3 million tonnes a year <sup>13</sup>. This all is expected to exacerbate a plethora of current social and economic hardships, for example, those who can afford to will be able to adapt to a changing climate and access necessities such as food, which will be harder to produce.

Numerous efforts are being brought to action, particularly in the recent decade, to address food wastage and security. There are several international organisations such as The UN's Food and Agriculture Organisation provides a methodology to measure food losses at each stage of the supply chain, identifying appropriate measures to reduce these losses. Such data can be seen in the *2019 FAO Report on The State of Food and Agriculture*. In Australia, The Australian Government is facilitating action through a commitment to reducing Australia's food waste by half by 2030. The 2020 report released by Food Innovation Australia Limited (FIAL), contracted by The Department of Agriculture, Water, and the Environment, provides a roadmap for facilitating this change <sup>14</sup>. Working with the Government, industry and key stakeholders, FIAL aims to move food waste and surplus food up the food recovery hierarchy, maximise social benefit and reduce the environmental impacts of food production by 2030

Additionally, Australian household composting has recently become a more viable option for urban households with two-thirds of Victorian councils accepting kerbside organic waste, ultimately reducing the amount of green waste sent to landfill <sup>16</sup>. The kerbside organics collection service recovers more than one million tonnes of organic food waste annually, processing this waste into usable mulch for nurseries, landscaping and agriculture businesses <sup>17</sup>. Reducing food waste is a critical step towards minimising GHG emissions and thus mitigating climate change. With the reduction of food loss and misuse as an essential target of the United Nations Sustainable Development Goals (SDGs), the Food and Agriculture Organisation of the United Nations (The FAO) state that this action will provide means to achieve other SDG targets relating to food security, nutrition and environmental sustainability <sup>18</sup>.

## **PROBLEM SUMMATION**

The Global Food Waste Project seeks to provide information on the causes of food waste and aims to highlight possible solutions. To achieve this, a number of resources can be found on this webpage that offer foundational knowledge on the subject. Food waste refers to the segment of edible food that is lost, uneaten and/or discarded. Internationally, it has been estimated that 1.3 billion tonnes of edible food is wasted per year, representing roughly 1/3 of the world's total food production (United Nations 2013). Humans' propensity to waste leads to major environmental, economic and social ramifications by exacerbating climate change and socio-economic inequality as well as driving up waste management costs.

Food waste happens for different reasons and at different points in the supply chain. In developing countries, waste occurs closer to the harvesting stage, mainly due to pest infestation and inadequate storage. Those problems have been largely eradicated for developed countries, such as Australia, where the majority of food waste occurs later on in the food supply chain (FAO 2020). In Australia, it is estimated that 7.3 million tonnes of food ends up in landfill every year, with primary production and households generating the most waste (Arcadis 2019). Even though there is a large amount of food wasted at the primary production stage, this is the more preferred option (Wozniacka 2019). As the wasted food will provide next year's crop with nutrients and it hasn't travelled enormous distances.

Household food waste on the other hand presents itself as the worst outcome as it has the highest environmental impact due to the amount of resources used along the supply chain (Arcadis 2019). Household food waste is the result of everyday purchasing and consumption practices that are heavily motivated by a variety of influences such as convenience, habit, value for money and lifestyle choices (Vermier 2006). Consumers need to be made more aware of the behaviours they perform and to do that requires education. With that in mind, the following resources shed light on the issue of food waste and offer educational material about appropriate food waste practices.



## RESOURCES

### Webpages

RESOURCE	FORMAT	DESCRIPTION
<b>GENERAL</b>		
Food and Agriculture Organisation of the United Nations (2020). <i>Food Loss and waste</i> . <a href="http://www.fao.org/food-loss-and-food-waste/en/">http://www.fao.org/food-loss-and-food-waste/en/</a>	Webpage	The Food and Agriculture Organisation of the United Nations (FAO) work towards the promotion of sustainable land and water use built upon the UN's sustainable development goals (SDGs). Their research into food waste involves international monitoring and assessment to better to understand the state of nutrition in the world. FAO also provides numerous reports and information on global food security.
CSIRO (2020). <i>Farming and food production</i> . <a href="https://www.csiro.au/en/research/farming-food">https://www.csiro.au/en/research/farming-food</a>	Webpage	CSIRO is Australia's leading scientific organisation. Their work in food production and waste includes assessments in crop and food processing technology, improving farming techniques, and work on creating a more sustainable food production system. CSIRO undertook one of Australia's most extensive food study on food loss across the horticultural value chain, assessing the quantity of human-grade edible food loss. The study found that nationally, Australia is losing 18-22% of its fruit and vegetable biomass through production and processing/ packaging stages. The entire food map report is available <a href="#">here</a> .
World Wildlife Fund (2020). <i>Reducing Food waste</i> . <a href="https://www.wwf.org.au/what-we-do/food/reducing-food-waste#gs.5nula3">https://www.wwf.org.au/what-we-do/food/reducing-food-waste#gs.5nula3</a>	Webpage	WWF researches the efforts being made by developed nations to reduce waste and testing food reduction methods in Australia to identify which solutions are the most practical.
Department of Agriculture, Water and the Environment (November 2017). <i>National Food Waste Strategy</i> . Australian Government. <a href="https://www.environment.gov.au/protection/waste-resource-recovery/publications/national-food-waste-strategy">https://www.environment.gov.au/protection/waste-resource-recovery/publications/national-food-waste-strategy</a>	Webpage	This Department of Agriculture, Water and The Environment's website contains Australia's national legislation regarding waste, laid out within <i>The National Food Waste Strategy Report</i> . The website also contains a detailed infographic of the efforts the department is doing to promote food waste reduction in Australia.

<p>Resourcesmart Schools  <a href="https://www.sustainability.vic.gov.au/schools">https://www.sustainability.vic.gov.au/schools</a></p>	<p>Webpage</p>	<p>ResourceSmart Schools is a program developed by Sustainability Victoria that supports Victorian schools to implement sustainable practices in school facilities, community and curriculum. The Waste Module provides resources for reducing waste in Victorian schools and is one of the five modules within the program, all of which focus on achieving sustainability goals.</p>
<p>What Is Food Loss And Food Waste?  <a href="https://foodsource.org.uk/building-blocks/building-block-what-food-loss-and-food-waste">https://foodsource.org.uk/building-blocks/building-block-what-food-loss-and-food-waste</a></p>	<p>Webpage</p>	<p>An overview of the causes and impacts of food waste from the University of Oxford's Food Climate Research Network</p>
<p>Cooperative Research Centre. (2020). <i>Designing effective interventions to reduce household food waste</i>. <a href="https://fightfoodwastecrc.com.au/project/consumer-attitudes/">https://fightfoodwastecrc.com.au/project/consumer-attitudes/</a></p>	<p>Webpage</p>	<p>An Australian national survey on food waste, conducted by the Corporate Research Centre in conjunction with Australian state governments, companies and various NGOs, has explored household food waste habits. Some findings revealed that one-third of participants reported that they could not tell if something was safe to eat, which resulted in households disposing of edible foods. 51% of household food managers understood the meaning of both use by and best before food date labels whereas less than half (47%) of Australian household food managers reported making use of leftovers most of the time and over a third (36%) rarely saved and ate leftovers. 4 in 10 people (44%) also reported making extra food 'just in case' half the time or more. These findings indicate that there is a critical knowledge gap between end-consumers and efficient food purchasing that is leading to food waste.</p>

## Educational Resources- Webpages

<b>EDUCATIONAL RESOURCES</b>		
Waste and Resources Action Programme (2018). <i>Love Food Hate Waste- About Us</i> . <a href="https://lovefoodhatewaste.com/about-us">https://lovefoodhatewaste.com/about-us</a>	Webpage	This webpage provides viewers with household tips and tricks on how to store food, meal planning, using leftovers and preparation. The campaign originated in the UK and has now expanded to Australia, New Zealand and Canada. The campaign has been very successful in the UK in reducing household food waste, with a reported 22% drop in household food waste between 2007-2012 being a result of educational campaigns. Also, the Waste and Resources Action Programme (WRAP) not only focuses on household waste but has programmes aimed across the entire food supply chain.
UN Environment (2020). <i>Think. Eat. Save- reduce your foodprint</i> . <a href="https://www.unenvironment.org/thinkeatsave/">https://www.unenvironment.org/thinkeatsave/</a>	Webpage	Think.Eat.Save. Reduce Your Foodprint is a global anti-food waste campaign, started by the UN and FAO. The campaign draws attention to the serious issues resulting from the high volume of perfectly edible food that is wasted and seeks to change attitudes and behaviours so that food waste can be significantly reduced around the world.
Foodwise (2020). <i>About Us- The Campaign</i> . <a href="http://www.foodwise.com.au/about-foodwise/the-campaign/">http://www.foodwise.com.au/about-foodwise/the-campaign/</a>	Webpage	DoSomething's FoodWise website gives practical advice and information on what individuals can do to solve the food waste problem. The campaigners seek to educate Australians to become more informed about the food that they eat. In short, they want Australians to become FoodWise. The website provides links to educational resources

## Literature

<b>LITERATURE</b>		
<p>Wozniacka, G. (2019, August 20). <i>Study Finds Farm-Level Food Waste is Much Worse Than We Thought</i>. Civil Eats <a href="https://civileats.com/2019/08/20/study-finds-farm-level-food-waste-is-much-worse-than-we-thought/">https://civileats.com/2019/08/20/study-finds-farm-level-food-waste-is-much-worse-than-we-thought/</a></p>	Article	<p>This article describes how farmers are faced with the sad reality of having to let their produce go to waste purposefully. Paying workers to pick produce, package it and ship it can cost more than the sale price of the produce. A recent study about on-farm food loss from Santa Clara University in the US found that 33.7 % of edible produce remains unharvested. The study's findings offer an accurate depiction of the problem with pre-harvested food. The study points out that growers have little control of how much produce is lost. Farm-level loss is the product of "field stability (how quickly a crop matures and how long it can stay in the field before going bad), weather, pests and plant diseases, labour availability, market prices, and buyer specifications for how produce should look and feel like." (Wozniacka, 2019). A number of solutions that target farm-level food loss include tax incentives for farms that donate food, connecting farmers with juice, kimchi and baby food producers and forcing retailers to buy entire fields from growers. Each solution doesn't come without creating other issues, such as logistical headaches, perpetuating the flawed ideal of ugliness and restricting farmers further.</p>
<p>Tuner, B. (2014, December 19). <i>Cut-price 'ugly' supermarket food won't reduce waste – here's why</i>. The Conversation. <a href="https://theconversation.com/cut-price-ugly-supermarket-food-wont-reduce-waste-heres-why-35375">https://theconversation.com/cut-price-ugly-supermarket-food-wont-reduce-waste-heres-why-35375</a></p>	Article	<p>This article discusses selling 'ugly food' and why it doesn't address the root cause of the issue, that being that consumers are over-buying. Woolworth's "Odd-bunch" sells non-aesthetically pleasing fruit, but this hasn't led to less household waste, rather, it encouraged people to buy and throw. What's more, charging lower prices for ugly fruit and vegetables also neglects the fact that the same labour is required to produce and harvest crops, regardless of their appearance. Thus, ugly food may help perpetuate a food system that undervalues food, in which consumers routinely buy too much and throw away the leftovers.</p>
<p>Perera, C. (2017, November 17). <i>I am not buying things': why some people see 'dumpster diving' as the ethical way to eat</i>. The Conversation. <a href="https://theconversation.com/i-am-not-buying-things-why-some-people-see-">https://theconversation.com/i-am-not-buying-things-why-some-people-see-</a></p>	Article	<p>This article on freeganism portrays the movement as one that seeks to decrease food waste. The majority of food that is thrown out in the commercial sector is still edible. This article poses the question of whether this could be a new form of consumerism and argues that people need to change their attitude to food.</p>

<p>dumpster-diving-as-the-ethical-way-to-eat-86536</p>		
<p>Devaney, L &amp; Davies, A, R. (2016). disrupting household food consumption through experimental HomeLabs: outcomes, connections, contexts. <i>Journal of consumer culture</i>. 17(3), 823-844.  <a href="https://doi.org/10.1177/1469540516631153">https://doi.org/10.1177/1469540516631153</a></p>	<p>Journal article</p>	<p>This journal article explores sustainable home-based eating practices and their role in decreasing food waste. Its findings centralised around the need to improve practices of everyday life such as buying, storing, preparing and cooking food. The authors use a practice-oriented participatory (POP) process to construct a framework for more sustainable eating. Essentially a POP process uses co-design (working with consumers) to create more relevant outcomes. The experiment aimed to disrupt the norms associated with the aforementioned practices of everyday life by implementing a suite of prototypes and educational interventions into households. It began by assessing pre-existing practices through initial data collection. The experiment then taught participants on sustainable food acquisition and food storage. Finally, participants learnt about further reduction techniques and appropriate food waste recovery. By focusing on a different eating practice each week, households were able to practice change gradually, and it meant that participants did not feel overwhelmed by interventions. From this, it can be deduced that educational campaigns can make a real difference.</p>
<p>Verghese, K. (2013). <i>Districts, Lifestyles and Avoiding Food Waste</i>. RMIT University.  <a href="https://www.mwrrg.vic.gov.au/assets/resource-files/Food-Waste-diary-and-data-collection-kit-Banyule.pdf">https://www.mwrrg.vic.gov.au/assets/resource-files/Food-Waste-diary-and-data-collection-kit-Banyule.pdf</a></p>	<p>Journal article</p>	<p>The Banyule City Council research paper hypothesised that there could be variations in food waste behaviours between suburbs. Its findings proved the hypothesis and outlined a need to tailor food reduction initiatives to specific groups. Some interesting points from that research included getting people to document their food waste can be effective in alerting them to the level of waste they are producing and has a positive impact on reduction. Planning of meals is also crucial to reducing food waste. Some key items that were wasted included vegetables, fruit, prepared meals, bread and cereals. Some reasons for waste included spoiled/mouldy food, expiry date overrun, plate leftovers, and over preparation.</p>
<p>Waitt, G. &amp; Phillips, C. (2016). Food waste and domestic refrigeration: a visceral and material approach. <i>Social &amp; Cultural Geography</i>, 17(3), 359-379, doi: 10.1080/14649365.2015.1075580</p>	<p>Journal article</p>	<p>This case study monitored 28 families in WA to learn about how human behaviour affects food waste with a focus on refrigeration. It looked at the practice of placing, rotating and assessing food items within the fridge, and how each practice can evoke a wide range of feelings such as disgust, pleasure and even anxiety. Their findings suggest that policymakers might benefit from proactively engaging consumers through creating opportunities whereby celebrity chefs use wilted, soft food in ways that entice consumers. Other suggestions included teaching new methods of food preservation or means of assessing food quality and encouraging refrigeration manufacturers to enhance visibility in the fridge.</p>

<p>Scialabba, N. E. H, Jan, O, Tostivint, C., Turbe, A., O'Connor, C., Lavelle, P., Flammini, A., Hoogeveen, J., Iweins, M., Tubiello, F.N., Peiser, L &amp; Batello, C. (2013). <i>Food Wastage Footprint: Impacts on Natural Resources, Summary Report</i>. <a href="https://www.researchgate.net/publication/262611961_food_wastage_footprint_impacts_on_natural_resources_summary_report">https://www.researchgate.net/publication/262611961_food_wastage_footprint_impacts_on_natural_resources_summary_report</a></p>	<p>Journal article</p>	<p>This summary report conducted by the FAO highlights the missed opportunity of harvesting the 1/3 third of all food that is wasted. This FAO study provides a global account of the environmental footprint of food wastage, factoring both food loss and waste along the supply chain and the impacts on climate, water, land and biodiversity. The study aims to answer two questions; what the magnitude of food waste on the environment is and what the primary sources of these impacts. This report would suit readers seeking food wastage information on a global scale.</p>
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## Reports

<b>REPORT</b>		
<p>Pearson, D., Miroso, M., Andrews, L. &amp; Kerr, G. (2017). Reframing communications that encourage individuals to reduce food waste. <i>Communication Research And Practice</i>, 3(2), 137-154, doi:10.1080/22041451.2016.1209274</p>	<p>Report</p>	<p>This report finds that if worthwhile reductions in food waste are to be achieved, it is first necessary to address the low level of awareness amongst individuals about the significance of the problem and its negative consequences on the environment and society as a whole. The challenge is encouraging positive changes in behaviour amongst these individuals.</p>
<p>Vergheze, K, Lewis, H, Lockrey, S &amp; Williams, H. (2013). <i>The Role of Packaging in Minimising Food Waste in the Supply Chain of the Future</i>.  <a href="https://chepedia.chep.com/media/24874/MIT-study_The-role-of-packaging-in-minimising-food-waste-in-the-supply-chain_June-2013_FINAL.pdf">https://chepedia.chep.com/media/24874/MIT-study_The-role-of-packaging-in-minimising-food-waste-in-the-supply-chain_June-2013_FINAL.pdf</a></p>	<p>Report</p>	<p>This report focuses on packaging opportunities that may help to reduce or recover food waste. It identifies that food packaging already plays an incredible role in preserving food for longer, and it explores opportunities for further improvements for packaging efficiencies. In 2013, Australia sent 4.2 million tonnes for food waste to landfill, of which 1.5 million came from the commercial and industry sector (the focus of the report). The largest contributor to food waste in the sectors came from cafes and restaurants. The report also states that food waste in food manufacturing (farming and processing) is largely unavoidable and has a very high recovering rate for animal feed/compost. Factors that contribute to food waste include the complexities involved in balancing and managing inventory stock; the need to maintain a wide range of menu choices and therefore ingredients; improper food storage; confusion over 'use-by' and 'best-before' dates; and large serving sizes. There are three main sources of food waste in the hospitality sector; these are preparation, consumers plate and product spoilage. A UK-based association for sustainable restaurants found that preparation was the cause for the most waste. While most opportunities to reduce waste are likely to be from changing behaviour, e.g., ordering and cooking practices, and providing better services for recovery of food waste; manufacturers could consider the potential to reduce food preparation waste by providing more pre-prepared ingredients (e.g. cut vegetables). Or even encourage diners to take their leftovers home.</p>

## Media Documentaries

<b>MEDIA- DOCUMENTARIES</b>		
<p>Sustain Table. (n.d.). <i>Waste Deep</i> [Documentary]. Vimeo.  <a href="https://sustainabletable.org.au/all-things-ethical-eating/waste-deep-documentary/">https://sustainabletable.org.au/all-things-ethical-eating/waste-deep-documentary/</a></p>	<p>Documentary</p>	<p>This documentary explores how humans are wasting over 8 billion dollars' worth of food every year in Australia (Montegriffo, E, CEO of Second Bite). This equates to over \$1000 per household while most of the wasted food goes to landfill. At the same time, over 2 million Australians cannot access food and rely on food relief programs.</p> <p>A lot of food wasted in Australia can be boiled down to consumers losing touch, as consumers nowadays can purchase food and eat whatever they feel like, whenever, regardless of what's in the fridge/pantry. It is suggested that increasing farming knowledge may promote respect for farmers and the produce that is grown. Currently, most Australians tend to shop with their eyes instead of actual intent to consume these food items. The documentary suggests that food planning can reduce this issue.</p>
<p>ABC. (2019). <i>War on Waste</i> [TV series].  <a href="https://iview.abc.net.au/show/war-on-waste">https://iview.abc.net.au/show/war-on-waste</a></p>	<p>Documentary Series</p>	<p><b>Series 2: Extra - Commercial Food Waste</b></p> <p>This episode explores food waste within the commercial sector. 2.2 million tonnes of food is wasted in Australia from commercial outlets and businesses, mainly due to minor issues with packaging/labelling. Supermarkets are also contributing to food waste in Australia because of the strict regulations around produce. Supermarkets can decide against purchasing food products if they no longer want it or even if the shipping is a little late (as little time as 30 minutes late).</p> <p><b>In Series 2: Episode 3 - The Battle Continues</b>, the food waste discussion is continued, and the specific of each sector and industry are explored. 5.3 million tonnes of food waste is produced every year in Australia, averaging down to 220 kilos of food waste per person. The commercial and industrial sector (cafes, supermarkets, restaurants) waste up to 2.2 million tonnes, 40% of this is preparation waste, 2% of this is spoilage waste, and 58% of this is plate waste by the consumer (29% of Australians leave food behind when they eat out (McGraw. D)). When food is left behind, roughly 15% of a meal on average is left behind</p> <p>The episode mentions a case example where businesses have made serious efforts to convert this wasted amount into commercial compost of various recycling products. Degraives St. Melbourne businesses send their food waste to the Degraives St Food Recycling Facility from food scraps such as coffee grinds to plate waste. Since the facility launched in 2013, it has reverted 392 tonnes of food to recycling from landfill. There is no cost to businesses to do</p>

		this. Via <a href="https://www.feedtheorca.com/">https://www.feedtheorca.com/</a> this food waste is sent to make energy or soils for community gardens etc.
Baldwin, G (2019). <i>Just Eat It</i> [Documentary]. Peg Leg Films. <a href="https://www.foodwastemovie.com/about/">https://www.foodwastemovie.com/about/</a>	Documentary	This documentary explores why supermarkets are allowed to set aesthetic standards for food and the impacts this has on farmers, with many of them being forced to send their produce to landfill as no big retailers will accept products that are not 'aesthetically pleasing'. The documentary encourages consumers to be more wary of their own food choices and how they manage their food waste as well as looking to promote a food revolution. It criticises the unrealistic standards of food that supermarkets impose. This documentary is based in North America, where one in ten people experience food insecurity, so this begs the question of why supermarkets and consumers waste so much food. The documentary also follows up on the obsession with expiry dates and portion sizes. It highlights how insignificant these things are when contrasting them to the impacts of food waste, such as immense greenhouse gas emissions that are released as a result of wastage.
The Waste Deep Documentary   20 Mins <a href="https://sustainabletable.org.au/all-things-ethical-eating/waste-deep-documentary/">https://sustainabletable.org.au/all-things-ethical-eating/waste-deep-documentary/</a>	Documentary	An informative free to view documentary on the scope of Australia's food waste problem. Explores the solutions to the issue via partner organisations such as Second Bite and Spade and Barrow as well as investigating the links between better education and lesser food wastage
War On Waste Iview Documentary (For Australian Viewers)   60 Mins <a href="https://iview.abc.net.au/show/war-on-waste">https://iview.abc.net.au/show/war-on-waste</a>	Documentary	Series 2, Episode 3: The Battle Continues + Series 2 Extra: Commercial Food Waste Provides key Australia-specific details on the scale and depth of issue of food waste. Highlights key causes and possible methods of alleviating food waste from the micro to commercial scale.

## Additional Videos- Youtube

<b>ADDITIONAL VIDEOS</b>		
Food Wastage Footprint   3 Mins <a href="https://www.youtube.com/watch?v=iocvrkcah6q">https://www.youtube.com/watch?v=iocvrkcah6q</a>	Video	A video by the Food and Agriculture Organisation of the United Nations about the environmental footprint of wasted food.
- The \$990 Billion Industry: Food Waste   4 Mins <a href="https://www.youtube.com/watch?v=svm9vcigh4k">https://www.youtube.com/watch?v=svm9vcigh4k</a>	Video	As food waste continues to be one of today's leading global issues, some people have found creative ways to make a profit. From grocery stores that only sell food waste to inventions that help extend shelf life of produce, business owners are helping the world (and their wallets) curb a global epidemic. This video makes the business case for fighting food waste.
Food Waste Is The World's Dumbest Problem   10 Mins <a href="https://www.youtube.com/watch?v=6rlxysfrkim">https://www.youtube.com/watch?v=6rlxysfrkim</a>	Video	Really engaging video that succinctly explains the systemic issue of food waste. Offers a handful of excellent examples on what can be done across the food supply chain to limit food waste. Basically, we are trashing our planet to make food.
Food Waste Causes Climate Change. Here's How We Stop It.   10 Mins <a href="https://www.youtube.com/watch?v=1mpfeesem_4">https://www.youtube.com/watch?v=1mpfeesem_4</a>	Video	Shows how food waste and climate change are linked, making the case that to save tomorrow we must eat today. The video is broken down into three questions, which are: Why is excessive food waste happening? What is food waste impact? How can we fix it?
Ten Stories About Food Waste   20 Mins <a href="https://www.electroluxgroup.com/en/ten-stories-about-food-waste-documentary-invites-to-change-24210/">https://www.electroluxgroup.com/en/ten-stories-about-food-waste-documentary-invites-to-change-24210/</a>	Video	Captivating short clips on the global issue of food waste, exploring the flaws of the food waste system and providing information and suggestions on what can be done about food waste from the individual level.
Hack: Australia's Food Waste Problem   1:03 Mins <a href="https://www.youtube.com/watch?v=gmzywjxwbs">https://www.youtube.com/watch?v=gmzywjxwbs</a>	Video	Why do Australians keep biting off - and wasting - more than they can chew?
FOOD WASTE IS THE WORLD'S DUMBEST PROBLEM  9:02 MINS	Video	Eat your peas! It's the easiest way to fight climate change. This is the fourth episode of Climate Lab, a six-part series produced by the University of California in partnership with Vox. Hosted

<a href="https://www.youtube.com/watch?v=6rlxysfrkim">https://www.youtube.com/watch?v=6rlxysfrkim</a>		<p>by Emmy-nominated conservation scientist Dr. M. Sanjayan, the videos explore the surprising elements of our lives that contribute to climate change and the groundbreaking work being done to fight back. Featuring conversations with experts, scientists, thought leaders and activists, the series takes what can seem like an overwhelming problem and breaks it down into manageable parts: from clean energy to food waste, religion to smartphones. Sanjayan is an alum of UC Santa Cruz and a Visiting Researcher at UCLA.</p>
<p>TASTE THE WASTE   3:01 MINS  <a href="http://tastethewaste.com/info/film">http://tastethewaste.com/info/film</a></p>	<p>Video</p>	<p>Amazing but true: On the way from the farm to the dining-room table, more than half the food lands on the dump. Most of it before it ever reaches consumers. For instance every other head of lettuce or potato.</p> <p>European households throw away 100 billion Euros worth of food each year. As much as the annual turnover at Nestlé, the world’s largest food corporation. The food we throw away in Europe would be enough to feed all the hungry people in the world two times over.</p> <p>Agriculture is responsible for more than a third of the greenhouse gases worldwide because farming requires energy, fertilizers and land. What’s more, whenever food rots away at a garbage dump, methane escapes into the atmosphere, a climate gas with an effect 25 times as powerful as carbon dioxide. In other words: when we waste half of our food that has a disastrous impact on the world climate.</p>

## Organisations

<b>ORGANISATIONS</b>		
Foodbank (2020). <i>Food Waste Reduction</i> . <a href="https://www.foodbank.org.au/hunger-in-australia/what-we-do/reducing-food-waste/?state=nsw-act">https://www.foodbank.org.au/hunger-in-australia/what-we-do/reducing-food-waste/?state=nsw-act</a>	Organisation	Foodbank is Australia's largest food relief organisation that targets the entire supply chain, from farmers to retailers, tackling food insecurity and food waste. In the last year, Foodbank rescued approximately 30 million kilograms of food and groceries, distributed through 2,600 charities and 1,750 schools. Foodbank's latest collaboration will see a Fare Share kitchen in Brisbane, with one million meals expected for charities across Queensland in its first year.
Yume (2020). <i>How Yume Food works</i> . <a href="https://yumefood.com.au/">https://yumefood.com.au/</a>	Organisation	Yume's mission is to create a world without waste by facilitating the sale and donation of surplus food that may have otherwise been discarded. The existing food supply framework in Australia means that 7.3 million tonnes of food are discarded each year. It's estimated that between 400,000 and 600,000 tonnes of that food are accessible, edible, quality food and could not just be rescued, but used, eaten and enjoyed. More than a quarter of the water we use globally goes to grow the 1.3 trillion kilograms of food that no one will ever eat. Additionally, the planet simply can't absorb the enormous amounts of methane produced by fresh food in landfill as it breaks down.
OzHarvest (2020). <i>Let's fight food waste</i> . <a href="https://www.ozharvest.org/fightfoodwaste/">https://www.ozharvest.org/fightfoodwaste/</a>	Organisation	The OzHarvest Market is Australia's leading rescued food supermarket, stocked with produce that has either been donated or would otherwise go to waste but is perfectly edible.
Second Bite (2020). <i>About Second Bite</i> . <a href="https://www.secondbite.org/about-us">https://www.secondbite.org/about-us</a>	Organisation	Second Bite takes in donated food, via processes of food rescue and surplus fresh food and distributes this food to charities and non-profits all around Australia. Second Bite distributes to over 1,000 community food programs around Australia
UN FAO <a href="http://www.fao.org/platform-food-loss-waste/en/">http://www.fao.org/platform-food-loss-waste/en/</a>	Organisation	The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger.
AUSTRALIAN GOVERNMENT ON FOOD WASTE <a href="https://www.environment.gov.au/protection/waste-resource-recovery/food-waste">https://www.environment.gov.au/protection/waste-resource-recovery/food-waste</a>	Organisation	Australia has set a goal to halve its food waste by 2030, aligning with the UN's Sustainable Development Goal 12.3. It has created a National Food Waste Strategy to meet that target.

FOOD INNOVATION AUSTRALIA LTD (FIAL) <a href="https://fial.com.au/">https://fial.com.au/</a>	Organisation	FIAL is an industry-led, not-for-profit organisation focused on growing the share of Australian food in the global marketplace
FIGHT FOOD WASTE CRC <a href="https://fightfoodwastecrc.com.au/">https://fightfoodwastecrc.com.au/</a>	Organisation	The Fight Food Waste CRC aims to improve the competitiveness, productivity and sustainability of the Australian food industry. Research partners and industry participants undertake high quality research to solve industry-identified problems through outcome-focused collaborative partnerships. They also encourage and facilitate small and medium enterprise (SME) participation in collaborative research through their SME Solutions Centre.
WWF <a href="https://www.wwf.org.au/what-we-do/food/reducing-food-waste#gs.9i9kck">https://www.wwf.org.au/what-we-do/food/reducing-food-waste#gs.9i9kck</a>	Organisation	Aims to help businesses and consumers to avoid and reduce food waste – for example through education, waste tracking and better date labelling.
CITY OF MELBOURNE <a href="https://www.melbourne.vic.gov.au/residents/waste-recycling/food-waste/pages/food-waste.aspx">https://www.melbourne.vic.gov.au/residents/waste-recycling/food-waste/pages/food-waste.aspx</a>	Organisation	The City of Melbourne is committed to working towards a zero waste city. To achieve this, the City of Melbourne has released a number of reports and strategies, as well as joining Sustainability Victoria’s Love Food Hate Waste program.
CSIRO <a href="https://www.csiro.au/">https://www.csiro.au/</a>	Organisation	The Commonwealth Scientific and Industrial Research Organisation is the Australian Federal Government’s scientific research body. The CSIRO undergoes many food waste related research projects with many innovative ideas in process such as mapping food loss and converting food waste into nutritious ingredients.
FOOD AGILITY CRC <a href="https://www.foodagility.com/how-we-work">https://www.foodagility.com/how-we-work</a>	Organisation	Food Agility provides investment for research and innovation to develop digital-based solutions to the issues of global food waste.
SUSTAINABILITY VICTORIA <a href="https://www.sustainability.vic.gov.au/schools">https://www.sustainability.vic.gov.au/schools</a>	Organisation	The Victorian government agency delivers programs on integrated waste management, climate change and resource recovery to promote and facilitate environmental sustainability. ResourceSmart Schools is one program offered by Sustainability Victoria that supports Victorian schools to implement sustainable practices in school facilities, community and curriculum.
COOL AUSTRALIA <a href="https://www.coolaustralia.org/activity/aussii-waste-audit-upper-primary/">https://www.coolaustralia.org/activity/aussii-waste-audit-upper-primary/</a>	Organisation	Cool Australia is a not-for-profit organisation that provides free teaching tools, resources and professional development courses for Australian school teachers. Resources relating to food waste management include waste audit activities which can be applied when working on ResourceSmart Schools Waste Module ( <a href="https://www.sustainability.vic.gov.au/School/Modules/Waste-module">https://www.sustainability.vic.gov.au/School/Modules/Waste-module</a> ).



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  - <sup>3</sup> Food and Agriculture Organisation, 2020
  - <sup>4</sup> United Nations, 2013
  - <sup>5</sup> United Nations, 2013
  - <sup>6</sup> Scialabba, *et al.*, 2013
  - <sup>7</sup> United Nations, 2013
  - <sup>8</sup> World Wildlife Fund, 2020
  - <sup>9</sup> UN WWAP, 2019, p.56
  - <sup>10</sup> United Nations, 2013
  - <sup>11</sup> Scialabba, 2013
  - <sup>12</sup> IPBES, 2019
  - <sup>13</sup> Frischmann, 2018
  - <sup>14</sup> Food Innovation Australia Limited 2020
  - <sup>15</sup> Food Innovation Australia Limited 2020
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