

# Food Waste Reduction Roadmap

Mapping out solutions for food waste reduction at each stage of the food supply chain.

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NZ FOOD WASTE  
CHAMPIONS 12.3



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**Authors:** Tessa Vincent, Founding Coordinator NZ Food Waste Champions 12.3 and Trixie Croad, Food Waste Innovation Research Theme Manager, University of Otago.

**Contact:** [nzchampions123@gmail.com](mailto:nzchampions123@gmail.com) or [food.waste@otago.ac.nz](mailto:food.waste@otago.ac.nz)

“There is a real opportunity to make food waste reduction one of the key ways we reduce greenhouse gas emissions and put our food system on a trajectory to a more sustainable future”  
- Richard Swannell (WRAP)<sup>1</sup>

“We see money being poured into plastics, the oceans, forests etc. but not into food loss and waste and we need to get it up the agenda”  
- Liz Goodwin (Global Champion of 12.3)<sup>2</sup>

“We urgently need to redesign our food systems. This year, COVID-19 has not only forced us to rethink our way of life and adapt to new realities. The pandemic has also proven the importance of sustainable food systems, from how we produce and process food, to the supply chains that bring it to our homes”  
- Stella Kyriakides (Global Champion of 12.3)<sup>3</sup>

“By 2030 annual food loss and waste will hit 2.1 billion tons worth \$1.5 trillion”  
- Boston Consulting Group<sup>4</sup>

“Reducing FLW would indeed help reduce the environmental footprint and GHGs of food systems, while at the same time improving food security”  
- World Bank<sup>5</sup>

“If New Zealand is to develop a framework for reducing its waste footprint, it needs better and more consistent information about the quantity of food it wastes”  
- NZ Environment Select Committee<sup>6</sup>

<sup>1</sup> Richard Swannell, Director WRAP GLOBAL, [Halving Food Loss and Waste in the EU](#), 2020 at 8.

<sup>2</sup> Champions 12.3, [Success or Crisis in 2030? The Fight to Halve Food Loss and Waste](#), September 2020.

<sup>3</sup> Stella Kyriakides, [Statement by Commisisoner Kyriakides on the first International Day of Awareness of Food Loss and Waste](#), 28 September 2020.

<sup>4</sup> Boston Consulting Group, [Tackling the 1.6-Billion-Ton Food Loss and Waste Crisis](#), August 2018.

<sup>5</sup> World Bank, [Addressing Food Loss and Waste: A Global Problem with Local Solutions](#), 2020 at xiii.

<sup>6</sup> Environment Select Committee, [Briefing to investigate food waste in New Zealand](#), March 2020 at 4.

# Why Food Waste Matters



# WHY FOOD WASTE MATTERS

Globally, one third of all food is lost or wasted from farm to fork. Food waste has **economic**, **environmental** and **social** consequences:



While reducing food waste has always been important, it matters now more than ever because of two big Cs, Covid-19 and Climate Change:

## COVID-19

Covid-19 upended food supply chains, increased food insecurity and exacerbated the food waste challenge. An estimated 1 million Kiwis struggled to afford food during 2020.<sup>10</sup> Food was also thrown away as markets collapsed. In saying that, Covid-19 highlighted the value of food. Lockdowns led to a 34% reduction in waste of certain products<sup>11</sup> and people began to appreciate the art of cooking at home, buying local and consuming healthy food.<sup>12</sup> **We need to encourage decision-makers to pursue food waste reduction as part of Covid-19 responses.**<sup>13</sup>

## CLIMATE CHANGE

Climate change is the biggest global issue that we face in the 21<sup>st</sup> century. If food waste were a country, it would be the third largest emitter globally, behind the United States and China.<sup>14</sup> Flipping the problem to an opportunity, reducing food waste has been ranked the third best action we can take to combat climate change.<sup>15</sup> Since New Zealand (NZ) has declared a climate emergency, influential actions to reduce GHG emissions, like food waste reduction, need to be prioritised. **We need to encourage decision-makers to integrate food loss and waste reduction into climate strategies.**<sup>16</sup>

<sup>7</sup> UN FAO, [Food wastage footprint & Climate Change](#), 2012.

<sup>8</sup> UN FAO, above n 7.

<sup>9</sup> World Food Programme, ["2019 – Hunger Map"](#), August 2019.

<sup>10</sup> Stuff, Paul Mitchell ["Protecting Aotearoa's food supply in wake of Covid-19"](#), January 2021.

<sup>11</sup> WRAP, above n 10. These key items are: potatoes, bread, chicken and milk.

<sup>12</sup> New Food ["Survey reveals an increase in vegetable intake during pandemic"](#), January 2021.

<sup>13</sup> Global Champions of 12.3, [Call to Global Action on Food Loss and Waste](#), September 2020.

<sup>14</sup> UN FAO, above n 7.

<sup>15</sup> Project Drawdown, ["Table of Solutions"](#).

<sup>16</sup> Global Champions of 12.3, above n 13.

NZ Food Waste Champions 12.3, in partnership with the University of Otago and supported by AGMARDT and Countdown, have undertaken an eight month research project to map out solutions to food waste reduction. While we want to shine a brighter light on the food waste issue in NZ, it is more important to us to demonstrate the opportunities at play. Tessa Vincent (Coordinator, NZ Food Waste Champions 12.3) and Trixie Croad (University of Otago, Food Waste Research Theme) interviewed 12 NZ Champions of 12.3 and 30 representatives from across the food supply chain to identify opportunities within the following five stages:



We thank all of the organisations and individual Champions who were involved in interviews for this report. We especially thank Co-Chairs Miranda Miroso and Deborah Manning for their support. We also thank attendees at NZ's first Food Waste Summit, Te Hui Taumata Moumou Kai o Aotearoa, in March 2021 for their input.

# NZ FOOD WASTE CHAMPIONS 12.3



NZ Food Waste Champions 12.3 was launched on 12<sup>th</sup> March 2020, just before Covid-19 hit. Our vision is: *He taonga te kai – an Aotearoa where food is valued, not wasted.*

- [Champions](#) of 12.3 are a coalition of representatives from across the food supply chain, championing Aotearoa's progress towards Sustainable Development Goal Target 12.3 and halving food waste by 2030. Our Champions form the case studies in this report.
- [Citizens](#) of 12.3 are our grass-roots community-oriented advocates for food waste reduction, mainly in households. In reading this report, we welcome you to join our wider citizens community, led by a Steering Committee of 15 people who meet monthly.

NZ Food Waste Champions is based off a global “Champions of 12.3” initiative.<sup>17</sup> There are over 30 Global Champions who have made significant contributions to the thinking and delivery of the 12.3 goal since 2015. We thank the Global Champions of 12.3 for their ongoing support, as well as our Trans-Tasman friends Mark Barthel and Sarah May.



<sup>17</sup> Champions 12.3, <https://champions123.org>.

# SOME PROVISOS TO THIS REPORT

## SYSTEMS APPROACH

While we have separated the supply chain into key sections, we recognise that various stages are deeply interlinked and an intervention at one stage will impact other stages. We also recognise that there are a number of external forces at play, such as environmental regulation, access to land and natural resources and uncertainty around transport and markets. We encourage a holistic approach when dealing with food waste reduction across the whole food supply chain.

We recognise that while food waste reduction can reduce GHG emissions, increase food security, encourage farm welfare, healthy diets and effective trade, it needs to be considered in the context of broader strategies to transform the food system. We support efforts by The Aotearoa Circle and KPMG to develop a National Food Strategy.<sup>18</sup> One of our two new NZ Champions of 12.3, Angela Clifford (Eat NZ), is part of the leadership group that is considering a national strategy. We believe these efforts should be complimented by the appointment of a Minister for Food in NZ, not just Food Safety.<sup>19</sup>

## DEFINITIONS

To understand the food waste problem, we need to know relevant definitions, including of “food”, “food loss and waste” and “by-products”. The Ministry for the Environment is currently working on agreed definitions for NZ in this space. We welcome further consultation and engagement on these definitions.

In the meantime, for the purposes of this report, our definition of “food waste” is fairly broad but in line with international guidance. We primarily rely and follow Global Champions of 12.3 [guidance](#).<sup>20</sup>

- “Food” is any substance, whether processed, semi-processed or raw, that is intended for human consumption.
- “Food loss or waste” can occur across the *entire* food supply chain from the point that crops and livestock are ready for<sup>21</sup> harvest or slaughter through to the point that they are ready to be ingested by people.
- We do not distinguish between “food loss” and “food waste” in this report.<sup>22</sup>

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<sup>18</sup> The Aotearoa Circle “[KPMG Appointed Secretariat for New National Food Strategy Workstream](#)”, October 2020.

<sup>19</sup> In the United Kingdom, there is a specific Parliamentary Under Secretary of State for Food and Animal Welfare, [David Rutley](#).

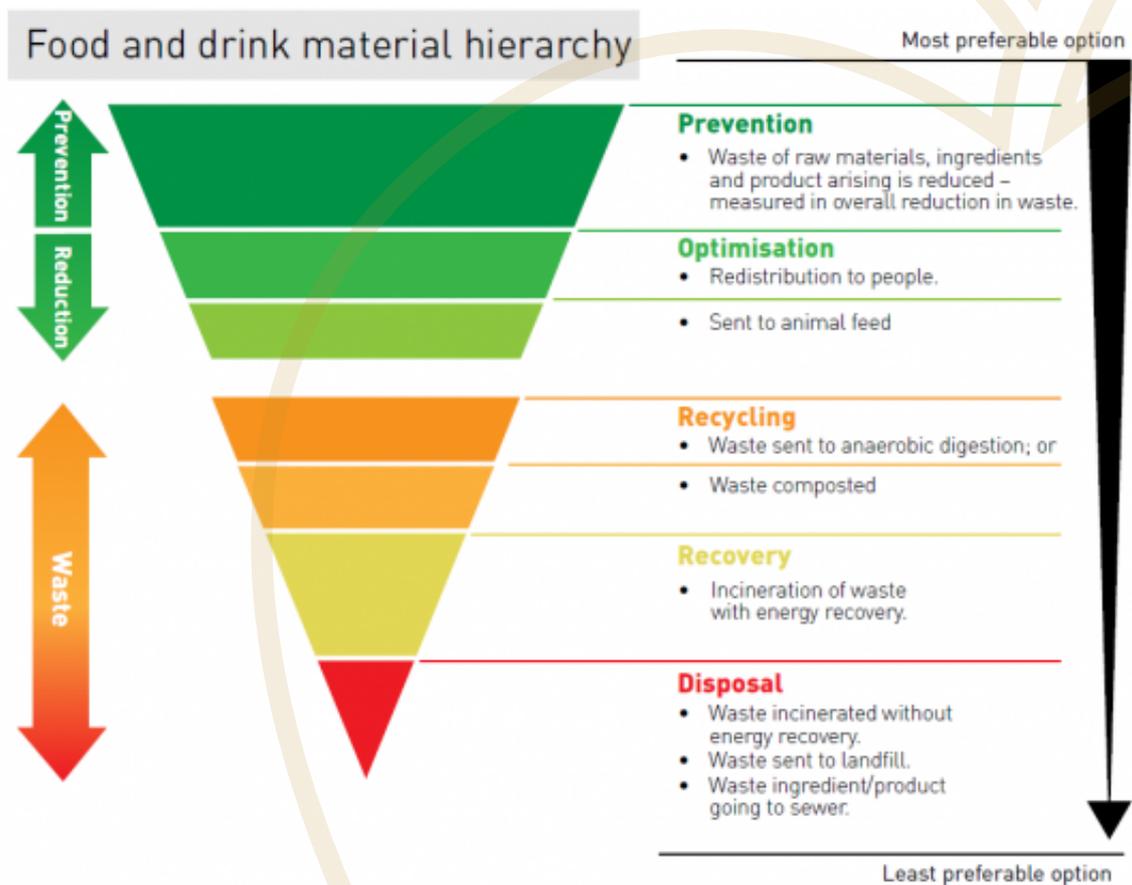
<sup>20</sup> Champions 12.3, [Guidance on Interpreting Sustainable Development Goal Target 12.3](#), 2017.

<sup>21</sup> We note that there is a debate to be had around “ready for harvest” versus “post-harvest”. One interviewee noted that from their primary production perspective, produce becomes food after it is harvested and food for people once it is certified. However, we have taken a broad approach to consider options around getting ready to harvest food harvested.

<sup>22</sup> According to the [World Resources Institute](#), “Food Loss” typically takes place at the production, storage, processing and distribution stages in the food value chain whereas “Food Waste” typically, but not exclusively, takes place at the retail and consumption stages in the food value chain.

- By-products are secondary streams that are generated as a result of the primary processing of a product (such as kiwifruit skins and seeds left after processing the fruit into kiwifruit juice, the pulp left over after extracting olive oil from olives or animal hides after meat processing).<sup>23</sup>
- Acceptable destinations for food, where it is not “wasted”, includes people and animal feed.

Our recommendations are also underpinned by the United Kingdom’s food waste reduction hierarchy (below).



Food and drink material hierarchy: [WRAP](#), UK. Note this diagram does not include “creating useful products” which could sit somewhere between optimisation and recycling.

<sup>23</sup> NZ Champion of 12.3, Anna Yallop, [Bioresource Processing Alliance](#), provided this definition.

## OTHER REPORTS/ SUMMITS

We encourage readers to refer to the Environment Select Committee and Miranda Mirosa [report](#),<sup>24</sup> which provide more detail on the overall challenges and opportunities to reduce food waste in NZ. Miranda is the Co-Chair of NZ Food Waste Champions 12.3 and has had input into this Roadmap.

We have drawn from the workshops at NZ's First Food Waste Summit in March 2021, Te Hui Taumata Moumou Kai o Aotearoa,<sup>25</sup> where draft solutions in this Roadmap were tested with an audience of over 100 people. We thank WasteMINZ for leading that momentous occasion.

## ONLY A SNAPSHOT

Our interviews provided a snapshot of some issues in the food supply chain when dealing with food waste. We have focused on the perspective of our 12 Champions to start to shine the light on positive interventions, and the information received from those that were interviewed as part of the study. This Roadmap is not a full and complete audit of food waste across the value chain and is not intended to be. Rather, it is a conversation starter to attract attention to food waste and get people thinking about what they can do in their organisation.

## FUTURE

We hope this Roadmap highlights positive initiatives that are occurring in our food system and provides an initial map for halving food waste by 2030 here in Aotearoa NZ, in line with Sustainable Development Goal Target 12.3. We hope to see all players (government, business and communities) build on the solutions in this Roadmap to drive food waste reduction for the benefit of our economy, planet and people. In particular, we request the New Zealand Government adds its own expertise to adopt and refine proposed solutions in this Roadmap.

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<sup>24</sup> Environment Select Committee and Miranda Mirosa, [Briefing to Investigate Food Waste in New Zealand](#), March 2020.

<sup>25</sup> To read more about the Summit, please see: NZ Food Waste Champions "[NZ's First Food Waste Summit](#)", April 2021 and Farmer's Weekly, "[Food waste strategy needed](#)", March 2021.

# Production



# PRODUCTION

*“Our primary sector is such a huge part of our economy and our brand”*

– Rt Hon Jacinda Ardern<sup>26</sup>

## OVERVIEW

Everything about food starts with production. In 2016, the food and primary sector accounted for 10.6% of New Zealand’s (NZ’s) Gross Domestic Product (GDP). Over 80% of the food NZ produces is exported and the activities of primary production cover 52% of NZ’s land mass and 4.1 million km<sup>2</sup> of ocean.<sup>27</sup> Reducing food waste is an opportunity to ensure efficiency and profit maximisation in production. Climate change is also now, more than ever, impacting land productivity and the marine environment. With increased interest in reducing NZ’s greenhouse gas (GHG) emissions in the production sector, food waste needs to be part of the equation.

We interviewed people working in the production sector from the following organisations: Agcarm, Horticulture NZ, Tegel Chicken, United Fresh New Zealand Incorporated, Meat the Need, Oakleys, Sanford, T&G Global, Summerfruit NZ and Goodman Fielder. We interviewed double the amount of organisations in this sector, partly because of AGMARDT’s support, but also because addressing food waste in production presents a unique opportunity for NZ.

Most of primary production in NZ is red meat and milk for export. Notably, our interviews did not focus on these areas and more research is necessary. This chapter focuses on horticulture due to the close link to domestic food supply, but food loss and waste in primary production is likely to be proportionate to the volumes of production in the various sectors. Further work and data are needed to understand the true barriers and opportunities to reduce food loss and waste across the whole primary sector.

## DATA

Food waste in the production sector is the hardest to quantify. Many interviewees did however note they are not recording data pre-packhouse and that food can often be left on a tree or dug back into the ground.<sup>28</sup> Estimates in NZ essentially rely on self-reportage. In saying that, a report on food waste quantification in NZ in 2011 suggests that approximately 7% of NZ’s food waste is related to “fresh” produce, and 93% relates to “processed” produce.<sup>29</sup> The Bioresource Processing Alliance (BPA) has suggested that at least 350,000 tonnes per annum of food by-products are not being effectively utilised.

<sup>26</sup> Rt Hon Jacinda Ardern, [Govt launches bold primary sector plan to boost economic recovery](#), 7 July 2020.

<sup>27</sup> Ministry for Primary Industries, [Briefing to the Incoming Ministers](#), 2017.

<sup>28</sup> This is still considered “waste” under international guidance: Champions 12.3, above n 19, but as mentioned a debate may need to be had around pre-harvested produce and when produce is considered “ready to harvest”.

<sup>29</sup> Christian John Reynolds, Miranda Miroso and Blent Clothier, [New Zealand’s Food Waste: Estimating the Tonnes, Value, Calories and Resources Wasted](#), 23 February 2016. Note the categorisation in the paper of “fresh” and “processed”.

Global estimates attribute between 21% to 36% of food loss to this first stage of the food supply chain.<sup>30</sup> In Australia, it is estimated that 31% of food wasted per annum exists in primary production – costing the sector \$1.1 – 2 billion dollars per annum.<sup>31</sup> According to WRAP, over three million tonnes of food is wasted before it even leaves United Kingdom (UK) farms, costing the UK more than 1 billion pounds.<sup>32</sup> In the United States, it is estimated that about 7% of produce is left unharvested in the fields every year.<sup>33</sup>

## BARRIERS

### SUDDEN EVENTS

Natural disasters, droughts and bad weather can affect production. Covid-19 caused a lot of lost crops because various market accesses were gone. For example, Horticulture NZ referred to impacts from Covid-19 affecting the adequate supply of fresh fruit and vegetables to domestic markets in both rural and urban communities, and delayed shipping impacted exports important to New Zealand's GDP. This meant crops grown for supply were not being harvested. Sanford noted markets such as high end food service in NZ, and buffets in the United States, being shut down – meaning a huge reduction in demand. Oakleys (a 5<sup>th</sup> generation horticultural farm) and others emphasised the issue of labour shortages from Covid-19, which caused waste in production. This has been highlighted by the media – as at September 2020, \$9.5B of the country's economy was at risk due to impacts of Covid-19.<sup>34</sup>

### STRICT STANDARDS

Food is being wasted because it does not meet strict industry standards. Horticulture NZ commented that growers face an ever-growing compliance burden to meet a range of market, regulatory and industry standards. Markets can require produce to 'look' a certain way, which influences factors such as the size and colour of each piece of produce. It also means produce that doesn't meet that standard isn't accepted, and there is often no secondary market to accept it. Sanford referred to the strict food quality and safety standards present within the seafood industry. Tegel noted there was opportunity to optimise the supply chain contracts and communication pathways so the full shelf life of frozen products could be utilised and product not unnecessarily discarded. Changes to product specifications or inability to accept variance can mean product cannot be sold.

### CREATING VALUE

Interviewees noted financial challenges when it comes to second-grade produce. High transport and packaging costs means that trialling the utilisation of by-products can often mean no profit. Another issue is scale. For example, Summerfruit NZ said there have been a lot of unsaleable

<sup>30</sup> World Resources Institute, *Reducing Food Loss and Waste, Setting a Global Action Agenda*, Executive Summary at 5.

<sup>31</sup> FIAL, *A Roadmap for reducing Australia's food waste by half by 2030*, 2020 at 4.

<sup>32</sup> WRAP, *Food surplus & waste in primary production costs UK more than 1 billion*, July 2019.

<sup>33</sup> Yasemin Y. Kor, Jaideep Prabhu and Mark Esposito "How Large Food Retailers Can Help Solve the Food Waste Crisis" Harvard Business Review, December 2018.

<sup>34</sup> Bonnie Flaws Stuff "This just cannot happen": \$9.5 billion at risk as horticulture sector struggles to fill \$25-an-hour jobs" September 2020.

cherries this season, but how do you find an outlet for 1500T of cherries? The costs may exceed the value in finding alternative supply chains.

## PESTS, DISEASES AND ANIMAL HEALTH

Agcarm, the industry association for members who manufacture, distribute or sell products that keeps animals and crops healthy, said you can lose up to 50% of crops as a result of pests and disease. These events can be widespread and/ or sudden, such as the Psa-V crisis in 2010 that almost decimated the kiwifruit industry in NZ.<sup>35</sup> In terms of animal health, we do not have good data on animal mortality rates in NZ nor sustainable on-farm disposal options. However, Agcarm noted that according to the World Health Organisation for Animal Health, up to 20% of livestock worldwide are lost to disease each year.

## LACK OF INNOVATION

Many interviewees called for more innovation and technologies. For example, how can we track demand and supply better? What innovative storage techniques might exist? The World Bank has recently emphasised the lack of investment in innovation for the agricultural sector: “The key sector in food systems is agriculture, where food is created. But despite being one of the largest employers and a key contributor to developing countries GDP, agriculture pales with other sectors (for example the health sector) in a number of related start-ups and level of investment.”<sup>36</sup>

## OPPORTUNITIES

### Government:

#### SET A TARGET

The NZ Government urgently needs to explicitly set a food waste reduction target of 50% by 2030, in line with the United Nations Sustainable Development Goal (SDG) Target 12.3. This move is supported by over 1000 New Zealanders, NZ Food Waste Champions, WWF, Countdown and other key organisations.<sup>37</sup> We recommend Minister Parker agrees to this high-level target, even before the Ministry for the Environment (MfE) sets its Waste Strategy. In doing so, NZ Government would rise to meet international standards. For example, at the heart of the recent European Green Deal is their *Farm to Fork Strategy*, where the European Commission has committed to SDG Target 12.3. That report also says the Commission will “investigate food losses at the production stage and explore ways of preventing them”.<sup>38</sup>

Another option is to explore a ban of food waste to landfill (see Household Chapter).

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<sup>35</sup> Glen Greer, Caroline Saunders, [The Costs of Psa-V to the New Zealand Kiwifruit Industry and the Wider Community](#), May 2012.

<sup>36</sup> World Bank Group, [Addressing Food Loss and Waste: A Global Problem with Local Solutions](#), 2020 p 18.

<sup>37</sup> NZ Food Waste Champions & Action Station “[Halve Food Waste by 2030](#)”, 2020.

<sup>38</sup> European Commission, [Farm to Fork Strategy](#), 2020

## MEASUREMENT AND SUPPORTING A VOLUNTARY COMMITMENT

The NZ Government needs to assist growers with measurement, so that the task is not overly burdensome. The Ministry for the Environment's (MfE's) intention to set a NZ food loss and waste baseline is promising and their work on definitions will also help.<sup>39</sup> MfE should also support efforts to get a Voluntary Commitment (VC) off the ground in NZ, as supported by over 90% of our interviewees. A VC involves business targets, measuring food waste and taking a series of actions, such as those recommended in this Roadmap. In the UK, their VC "Courtauld Commitment", contributed to reducing food waste by 27% over a 10-year period.<sup>40</sup> NZ Food Waste Champions are promoting the adoption of a VC programme and are seeking short-term funding from private and philanthropic players, and long-term funding from government. Many interviewees noted that mapping out a national food waste picture across all supply chains needs government support.

## CODES OF CONTRACTUAL CONDUCT

To tackle the 'Strict Standards' barrier identified above, the NZ Government could consider statutory codes of contractual conduct. The Unfair Trading Practices EU directive adopted in 2019, could be adequately transposed and implemented in NZ.<sup>41</sup> We could also learn from the UK, whose 2018 *Our Waste, Our Resources Strategy* suggested sector-specific statutory codes of contractual conduct being incorporated into an Agriculture Bill, to ensure perfectly good produce isn't prevented from moving up the supply chain.<sup>42</sup> The Government has subsequently agreed to new statutory Code of Conduct for the dairy sector, to increase fairness in the supply chain and help farmers become more competitive.<sup>43</sup>

## SUPPORT ALTERNATIVE MARKETS AND DONATION

In 2020, the Ministry for Social Development (MSD) invested \$32 million into secure food communities.<sup>44</sup> This has gone directly to food banks and food rescues charities as well as supporting three national NGO partners: the New Zealand Food Network (Case Study 1), the Aotearoa Food Rescue Alliance (Case Study 8) and Kore Hiakai – a collective supporting frontline community food organisations while also looking into root causes of food security. Unfortunately, the funding is only for a two-year period which is unsustainable. We encourage the NZ Government to continue to look into ways to expand and encourage donation or alternative markets. Following the United States' (U.S.) leadership on the 'Good Samaritan' clause in 2014 positively encouraged donation, by removing potential liability for food donors who donate food in good faith.<sup>45</sup> The NZ Government could take this further by considering U.S. and other tax incentives, which have been "extraordinarily successful in motivating food donation".<sup>46</sup>

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<sup>39</sup> Cabinet, [Government response to the Environment Committee Report on Food Waste](#), 2020.

<sup>40</sup> WRAP, ["What is the Courtauld Commitment 2025?"](#) 2020.

<sup>41</sup> European Commission ["Unfair trading practices in the food chain"](#), 2019.

<sup>42</sup> HM Government Department for Environment, Food & Rural Affairs (DEFRA), [Our Waste Our Resources Strategy](#), 2018.

<sup>43</sup> DEFRA and Victoria Prentis MP ["New Code of Conduct to ensure a fairer dairy supply chain"](#) February 2021.

<sup>44</sup> MSD, ["Food Secure Communities"](#), 2020.

<sup>45</sup> Food Act 2014: A donor is protected from civil and criminal liability that results from the consumption of food donated if it was safe and suitable when it left the possession or control of the donor and (if necessary) the donor provided information on how to keep the food safe and suitable.

<sup>46</sup> ReFED ["Federal Tax Incentives"](#), February 2021

## INVEST IN INNOVATION

Investment in innovation is needed to support initiatives that reduce food waste in the primary sector. A recent MPI investment of \$14.9 million over two years to redirect food from the primary sector that would otherwise be wasted to those in need, was a welcome step forward.<sup>47</sup> This could be taken further – for example, the UK is currently developing a £10 million collaboration fund, open to groups of producers interested in pursuing joint business models.<sup>48</sup> While mechanical harvesting may seem like years away due to many complexities, Government investment could fast-track its introduction. Removing regulatory barriers for trialling animal and crop health products could also be beneficial, as suggested by AgCarm. One interviewee referred to EECA’s model and the way they co-fund initiatives for energy efficiency and provide tools – “that sort of support for food waste would be quite interesting”.

## Producers:

### MEASUREMENT

As highlighted by a number of interviewees and the data overview above, we need to better understand the level of food waste in NZ’s primary production sector. All producers should start measuring their food loss and consider reporting into collaborative forums. This can be commenced quickly by following the international *Food Loss and Waste Protocol*<sup>49</sup> and guidance from WRAP’s recent *Grower guidance*.<sup>50</sup> (Refer to: For Government: Measurement to see how government assistance is necessary, as well as their setting of definitions). The Global 10x20x30 initiative shows some examples of a range of food retailers and providers who are measuring their food waste as part of collaborative forums.<sup>51</sup>

### IMPROVE HARVESTING PRACTICES, MANAGING PESTS AND DISEASES

For crop producers, improving practices includes harvesting at the right maturity and using the right techniques.<sup>52</sup> One interviewee noted that labour is also needed to ensure harvesting, and that intervention/ support is urgently needed to meet current labour shortages. For animal producers, better management involves preventing animal disease through vaccination, nutrition, biosecurity and good husbandry. For example, antibiotics and pain relief medicines are critical for animal health and welfare. Pest and disease eradication plans are also important. Summerfruit NZ said producers should have access to the “necessary plant protection products to ensure, that as much of the crop as possible will survive ... through the supply chain”. This underlines the importance of industry organisations like Agcarm, who need more widespread support to increase their staff and resources.

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<sup>47</sup> Hon Damien O’Connor, [Govt connecting kiwis to affordable, healthy food](#), August 2020.

<sup>48</sup> DEFRA, above n 43.

<sup>49</sup> [Food Loss + Waste Protocol](#)

<sup>50</sup> WRAP, [Grower guidance](#), March 2020.

<sup>51</sup> Jillian Holzer, WRI “[World’s Leading Food Retailers and Providers Engage Nearly 200 Suppliers in Cutting Food Loss and Waste in Half](#)”, September 2020

<sup>52</sup> FAO, [Global Food Losses and Food Waste](#), 2011.

## INNOVATION AND TECHNOLOGY

A number of different technologies and innovative practices were mentioned by our interviewees. We recommend producers keep up to date with these new technologies. Some examples are below:

- High Metabolisable Energy (HME) rye grass, which reduces GHG emissions and has greater tolerance to drought<sup>53</sup>
- Farming Data, which gives smallholder farmers real-time market information so they can more effectively reach markets and sell their crops.<sup>54</sup>
- AI machines to do the second pick for second tier fresh produce.<sup>55</sup>

(Refer to For Government: Invest in Innovation to see how technologies could be fast-tracked).

## IDENTIFY ALTERNATIVE MARKETS OR MAKE DONATIONS

To prevent food from being wasted, alternative markets should be explored (Refer to the Processing Chapter for more detail) or donations should be made (Case Study 1). Four donation initiatives from our interviewees are worth highlighting. First, T & G Global has launched Fairgrow. This new charity aggregates surplus and donated fresh produce from growers across Aotearoa, and together with the New Zealand Food Network gets it to communities in need. In its first nine months of operations, Fairgrow donated over 500,000kg of fresh produce.<sup>56</sup> Second, Meat the Need receives donated livestock from farmers and connects frozen meat to community organisations in Aotearoa. Over 650 animals have been donated since early 2020.<sup>57</sup> Third, Sanford donated 10 tonnes of seafood produce to food banks and maraes between March and September 2020. They are now a New Zealand Food Network partner. Finally, United Fresh diverted 60,000 5+ A Day fresh fruit and vegetable boxes to families during Covid-19, noting that the boxes were vital “to helping meet the increased demand”.<sup>58</sup>

## Community:

### GLEANNING

Gleaning refers to the collection of crops from fields where it is not economically profitable to harvest. Overseas, organisations like Feedback are coordinating volunteers, farmers and food distribution charities to undertake gleaning missions. Since 2012, Feedback’s Gleaning Network has worked with 60 farmers, 3,000 volunteers and numerous charities to rescue over 500 tonnes of fruits and vegetables that would otherwise be wasted.<sup>59</sup> While the gleaning movement has taken off overseas, it is yet to be appreciated in NZ. With oversubscribed volunteers for food rescue charities, we should be exploring the opportunity of getting these people, and other Kiwis, onto our fields for gleaning missions.

<sup>53</sup> Referred to be AgCarm. See for example: AgResearch “[HME ryegrass making steady progress](#)” August 2019.

<sup>54</sup> Farming data “[Trade crops easily between farmers and buyers](#)”.

<sup>55</sup> Referred to by Meat the Need. For example, Steve Saunders BBC “[The robots that can pick kiwifruit](#)”, 2020.

<sup>56</sup> [FairGrow](#)

<sup>57</sup> [Meat the Need](#)

<sup>58</sup> United Fresh Interview and News “[5000 5+ A Day Fresh Fruit and Vegetable Boxes Diverted to Families During Covid-19](#)”, April 2020. This was supported by funding from MoH, MPI and FoodStuffs.

<sup>59</sup> The Gleaning Network <https://feedbackglobal.org/campaigns/gleaning-network/>. Note as mentioned above, some interviewees would not consider this “waste” – hence more discussion is needed around definitions, led by MfE.

# Case Studies

## DEBORAH MANNING: NEW ZEALAND FOOD NETWORK



The New Zealand Food Network (NZFN) is a not-for-profit organisation that provides people in need with healthy food, through sharing bulk surplus and donated food. It was founded after the first Covid-19 lockdown in 2020 by NZ Champion of 12.3 Co-Chair, Deborah Manning. While the idea had been brewing for some time, investment from the Ministry of Social Development and others meant the NZFN could take off.

In October 2019, a staggering half a million Kiwis were living without reliable daily access to affordable and nutritious food. NZFN provides a system where bulk, quality, surplus and donated food, from producers, growers and wholesalers around the country, is aggregated, stored safely and made available to food rescue organisations, iwi and food banks across NZ, as mixed product pallets in quantities they can manage.

Deborah says the NZFN is a major social asset for NZ and addresses two unique problems. First, it provides a solution to food businesses by reducing the cost of distribution of their surplus food and providing a 'one stop shop' for them. Second, it provides a solution to food hubs – who are trying to meet rising food demand in to their communities. The NZFN systems and infrastructure are extensive, streamlined and nationwide.

NZFN works with a range of food producers, manufacturers and wholesalers to source a range of fresh and healthy foods, including fruit, vegetables, and protein. They also provide a purchasing service for the Government and food hubs. To get involved, visit: <https://www.nzfoodnetwork.org.nz>

# Case Studies

## SUSAN GOODFELLOW: LEFTFIELD INNOVATION



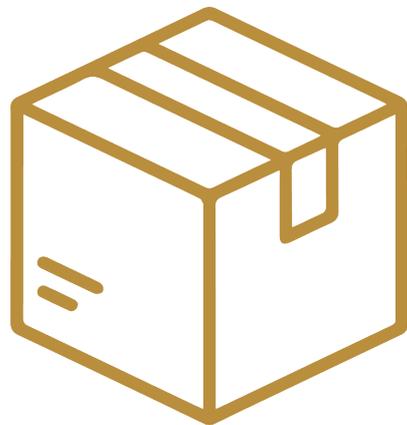
Leftfield Innovation is a collection of leading crop scientists, technologists and business innovators who share a vision for sustainable food production that delivers higher nutrition and value. Susan Goodfellow, NZ Champion of 12.3 from Leftfield Innovation, has led a number of significant projects in the production sector.

One of those involved working with Champion Flour Milling Ltd (Champion Flour), who supplies food companies throughout NZ and some export markets. To improve food waste reduction outcomes, Susan and her team helped Champion Flour to source grain varieties that are able to produce whole grain products so that 100% of the grain kernels can go into products fit for human consumption. Leftfield Innovation has in turn helped to increase the shelf life of Champion products and product that previously went to animal feed is now going to people.

Leftfield Innovation also believes in stronger connections between producers and customers. They are helping to build awareness around the health benefits of whole grain in NZ diets, so that this type of flour can appeal to the end consumer, demonstrating the connectivity of the supply chain.

Wheat is one example that will contribute towards Leftfield Innovation's multi-year programme to transform 100,000ha of sustainable land use that responds to a changing climate and provides food products for consumers who care about the environmental impacts of food production, including reducing food waste. This multi-year programme will include other land uses such as ancient grains, pulses, seeds, and horticulture that complement a mixed farm system including animals; and is a partnership between farmers, food companies, regional councils, processors and agribusinesses. To seek Leftfield Innovation's advice, visit: <https://www.leftfieldinnovation.co.nz>

# Processing



# PROCESSING

*“Being able to make it easier for companies to start on that sustainable journey is really important”*

– Anna Yallop, Bioresource Processing Alliance<sup>60</sup>

## OVERVIEW

The processing section of the food supply chain includes all of the steps post-farm and pre-retail. Our interviews have mainly focused on manufacturing or advisory organisations. These organisations should be concerned about food waste, not only because of environmental impacts but also due to the cost-effectiveness of solving food waste issues. We acknowledge other steps in the supply chain, particularly transport, require a deeper dive to prevent lost produce and reduce GHG emissions.

We interviewed three advisory and innovation organisations who support manufacturing businesses: Callaghan Innovation,<sup>61</sup> Plant and Food Research<sup>62</sup> and Food Innovation Network.<sup>63</sup> We then interviewed the lead of a collaborative venture called “Sustainable is Attainable” with 22 food manufacturers underneath,<sup>64</sup> as well as Frucor’s “Simply Squeezed”.<sup>65</sup>

## DATA

In NZ, there are data gaps on how much food is wasted in the processing sector. The best research we have is from the Sustainable Business Network (SBN) in 2017. The study found that 40,800 tonnes of food waste is generated per annum by food manufacturers of which 28% (11,424 tonnes) goes to landfill. The qualitative research also highlighted a desire to increase collaboration around optimising food waste practices<sup>66</sup>

In Australia, an estimated 24% of total food waste occurs within manufacturing.<sup>67</sup> Another international study found that manufacturers suffer a loss of 1 tonne of food for every 35 tonnes produced.<sup>68</sup> In Scotland, where there is a similar population to New Zealand, it is estimated that food waste in the manufacturing sector costs businesses £950 per tonne.<sup>69</sup>

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<sup>60</sup> Interview with Bioresource Processing Alliance Champion Anna Yallop, November 2020.

<sup>61</sup> [Callaghan Innovation](#)

<sup>62</sup> [Plant and Food Research](#)

<sup>63</sup> [Food Innovation Network](#)

<sup>64</sup> Venture Timaru “[Timaru’s food and beverage processors target reducing plastics and biowaste](#)”.

<sup>65</sup> [Simply Squeezed](#)

<sup>66</sup> Sustainable Business Network, Submissions Briefing to investigate food waste – “[Industrial food waste research – Auckland](#)”, July 2017.

<sup>67</sup> Arcadis, [National Food Waste Baseline – Final assessment report](#), March 2019.

<sup>68</sup> Dr Manoj Dora, Brunel University London and Ghent University “[Human error major cause of food waste in manufacturing](#)”, January 2019,

<sup>69</sup> Zero Waste Scotland, “[Reducing Food Waste in Manufacturing and Retail](#)”, 2020.

## BARRIERS

### PRODUCT REQUIREMENTS, FOOD SAFETY AND FAULTS

Food that is failing to meet product specifications may fall off production lines and go into the bin. A bad bar code or faulty packaging can also lead to entire loads being rejected later down the supply chain. Some brands are fearful of then redistributing this good food because of brand reputation. Food safety is another product requirement that requires manufacturers to take a cautious approach. One interviewee said that “when you’re dealing with [potentially] wasted food, you have to be a lot more careful about quality”.

### FORECASTING

Due to a lack of forecasting, many manufacturers are unable to determine the right amount of raw ingredients required to produce products. As a result, a substantial amount of food can go to waste. Some manufacturers tend to over-produce orders just in case they find themselves getting caught short when passing on to the retailer/ food outlet. Sometimes manufacturers’ procurement departments might also over-order on ingredients to obtain a cheaper unit price. Ultimately, businesses can be so busy processing, they don’t have the time, resources or money to accurately identify or prevent waste streams.

### PRODUCTION PROBLEMS

- *Development:* New product development and factory trials can create food waste because product quality, taste, machinery and packaging have to be continually tested. New product development can be seen as market sensitive and inappropriate for redistribution.
- *Cleaning processes:* Cleaning processes for production changes may also produce waste. For example, if you are making tomato sauce and then want to make mustard sauce, this means the whole process must be cleaned, contributing to loss. Allergy requirements may also require more cleaning to occur to ensure health risks are mitigated.
- *Machinery:* Performance problems with machinery are one of the top causes of waste in the processed foods sector in the UK. For example, product blockages and mechanical mishandling accounts for up to three quarters of food wasted by ready meals and chilled product manufacturers.<sup>70</sup>

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<sup>70</sup> The Grocer, “[10 ways food is wasted by manufacturers](#)”, January 2017. This sub-sector produces 12% of total waste in the food and drink supply chain.

## STORAGE AND COLD CHAIN

The carbon cost of cool chains was referred to by Plant and Food Research as an important area for research and innovation. As the climate warms, the growing demand for cooling is creating more warming in a destructive feedback loop. The lack of adequate cold chains is responsible for about 9% of lost production of perishable foods in developed countries and 23% in developing countries.<sup>71</sup> Storage costs were another barrier identified by interviewees and those who attended the Food Waste Summit.

## COMMERCIAL VIABILITY

Many interviewees noted the difficulties of commercial viability when it comes to by-product upcycling. Callaghan Innovation said that “when you have large producers that have food waste challenges, turning [that food] into an added value ingredient is quite exciting, but you may not have the right channels to commercialise that”. The Food Innovation Network also recognised a “massive opportunity in converting primary produce into viable streams”.

## OPPORTUNITIES

### Government:

## INVESTING IN RESEARCH AND INNOVATION

The NZ Government supports a number of research and development institutions, such as those we interviewed. However, it became clear that food waste reduction is not a priority area for investment. By comparison, in Australia, the Fight Food Waste Co-operative Research Centre has a specific food waste focus with significant capital of \$121 million behind it for a ten year period. As part of Australia’s National Food Strategy 2017, they announced more than \$10 million to support research directly related to food waste.<sup>72</sup> In the UK significant government investment has gone behind WRAP – a non-profit institution which is as a world-leader in research on food waste reduction.<sup>73</sup> The University of Otago’s Food Waste Theme, in collaboration with other research institutions, could be a testing ground for targeted government investment (Case Study 5).

## GUIDANCE ALONGSIDE PRODUCT INFORMATION FORMS

Product information forms (PIFs) help food companies collate information needed to meet regulations and industry codes. They may include information about, for example, allergens, shelf life, pack size, best before dates and what testing has been done. One interviewee referred to the potential role for government in highlighting avenues for product that might not meet the requirements within PIFs, but may still hold value. Exploring the alternative options for utilising non-optimum food product and collating this into guidance is an area that NZ Food Waste Champions, with government support, could explore.

<sup>71</sup> International Institute of Refrigeration, “[The Role of Refrigeration in the Global Economy](#)”, November 2015.

<sup>72</sup> Australian Government, [National Food Waste Strategy: Halving Australia’s Food Waste by 2030](#), November 2017.

<sup>73</sup> [WRAP](#)

# Government | Manufacturers:

## COLLABORATION

The interviews highlighted the value of collaboration within the processing sector to ensure all food is valued, not wasted. Since 2018, Venture Timaru has hosted 22+ processors as part of a “Sustainable is Attainable” venture, to research ways to improve product sustainability, and explore value add and circular economy opportunities. Waste stream data has been collected and analysed by three research students funded by Callaghan Innovation, to highlight opportunities such as protein extraction and generating fuel from bio-waste. By coming together, the companies had a better understanding of the scale of their waste streams and where they overlap.<sup>74</sup> At the Food Waste Summit, one workshop table suggested councils should be given scope to support business and collaborate too. Many interviewees also referred to the benefits in collaborating with Callaghan Innovation or Bioresource Processing Alliance (Case Study 3).

## FOOD LABELS AND PACKAGING

An important role for food packaging is to retain and optimise the value of food that has been produced. New packaging methods, such as controlled atmosphere packaging (CAP), extend shelf-life. This method requires the addition of oxygen absorbers to food packaging, to regulate the temperature and humidity of a product, and can be hugely beneficial for manufacturers who need to store food products for long periods of time. Labelling is another area that can optimise the value of food, and many industry groups are calling for better streamlining of labelling. Both government and manufacturers have a role to play to ensure effective packaging and labelling practices that complement food waste reduction.<sup>75</sup>

## UPCYCLING

Offcuts and surplus streams can be more valuable than you think. Manufacturing new product lines from waste streams has the potential to generate new income and diversify a business. As one interviewee has said “by-products drive innovation and excitement around new products [and] it can develop a new relationship with your customer”. Examples of upcycling/ by-product valorisation are endless, but some are listed below and in our case studies:

- Excess bread used to make beer or croutons e.g. Citizen<sup>76</sup>
- Fish heads distributed to marae (a delicacy in Māori culture) e.g. Kai Ika<sup>77</sup>
- Meat from delis into pet food e.g. Deja<sup>78</sup>
- Grape seed extracts from wine and grapes e.g. NZ Extracts Ltd<sup>79</sup>
- Extracting ingredients to create NZ flavour extracts e.g. Callaghan Innovation, Sensient and Simply Squeezed collaboration

<sup>74</sup> Venture Timaru interview | Samesh Mohanlall Stuff “[Timaru’s food and beverage processors target waste](#)”, August 2020.

<sup>75</sup> For further information, refer to Miranda Miroso, [Briefing to Investigate Food Waste](#), June 2019 at 35.

<sup>76</sup> Case Study 6 and [Citizen](#)

<sup>77</sup> [Kai Ika](#)

<sup>78</sup> [Deja](#)

<sup>79</sup> Plant & Food Research [NZ Extracts Ltd](#)

The NZ Food Innovation Network is a Government supported organisation that enables businesses to test new products and processes. Its Auckland facility, the FoodBowl, is increasingly supporting projects on upcycling as part of its Sustainability Programme. The Bioresource Processing Alliance is another venture that is assisting with by-product valorisation (Case Study 3).

## Manufacturers:

### PROCESS OPTIMISATION

A key step for processing businesses is to look carefully at their processes and refine them where they can. This will illuminate where processes are or aren't adding value; what area of the business is consuming the most resources; and where by-products are being produced for example through offcut spoilage and rejects. Three key steps should be taken. First, measuring waste to identify hot spots. Second, implementing improvements, ranging from eliminating unnecessary or repetitive processes to training staff<sup>80</sup> and the efficient use of equipment. Third, by-products can be turned into income streams (Case Study 3) or redistributed to people who need it most (Case Study 1).<sup>81</sup> The appointment of a sustainability consultant or staff member tasked with process optimisation may involve up-front investment, but will ultimately result in likely cost savings.

### ADOPTING GOOD SOFTWARE

Enterprise resource planning (ERP) software is an ideal solution for food manufacturers looking to reduce food waste. With better and more accurate forecasting models, food manufacturers can spend less time guessing and more time maximising the ingredients they have. With an ERP system, you can track lots, analyse shelf life, avoid overstocking, create accurate inventory orders, avoid cross contamination and everything in between. There are many different ERP software options in NZ, for example Solnet<sup>82</sup> and Verde.<sup>83</sup> Ordering software like Fresho can also improve efficiencies both for the supplier and the purchaser.<sup>84</sup>

### KNOWING THE CUSTOMER

Another way for manufacturers to reduce food waste is to know their customers and meet their needs. For example, food manufacturer Duncan Hines found out that most of their cake mixes were much too large for an individual or small family and came out with a new line, known as Duncan Hines Perfect Size Cakes. This satisfied a wider demographic that was previously discarding as much as half of a baked cake.<sup>85</sup> Another great example is Simply Squeezed, who

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<sup>80</sup> One study found after assessing 47 food manufacturers in Belgium that human error accounted for 10.9% of all food waste: Foodbev Media & Brutel University London | Ghent University, Dr Manoj Dora "[Human error major cause of food waste in manufacturing – study](#)", January 2019.

<sup>81</sup> Simply Squeezed donated fruit to frontline workers during lockdown: NZ Herald "[Simply Squeezed donates to Hawke's Bay frontline staff](#)", May 2020.

<sup>82</sup> [Solnet](#)

<sup>83</sup> [Verde:](#)

<sup>84</sup> [Fresho](#)

<sup>85</sup> Fooddive, "[Pinnacle innovates based on consumer trends](#)"

utilise and sell not only lemon juice but lemon cells, peel and other by-products from the juicing process (to produce lemon extracts). If manufacturers are doing the right thing, they should tell this story. Consumers want to see more from businesses and around half of Kiwis have deliberately made a switch to a brand that is more sustainable.<sup>86</sup> Attendees at the Summit also noted an increasing interest in 'ugly' produce and that "story-telling is key".

## COLD CHAIN AND STORAGE OPTIMISATION

While cold chain experts and transport providers were not included in our interviews, international research shows that improved temperature management, transportation and storage techniques can dramatically reduce food waste. For example, prepared for the Department of Agriculture, Water and the Environment and Refrigerants Australia recommended better food handling, such as reducing the time food spends outside refrigerated environments during transfer, more accurate measurement of food temperature and better monitoring of all steps in the cold chain.<sup>87</sup> The potential impact of improved cold chains could account for 19-21 Gt CO<sub>2</sub>e of avoided emissions.<sup>88</sup>

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<sup>86</sup> Colmar Brunton, [Better Futures 2020](#), February 2020.

<sup>87</sup> Expert Group, [A study of waste in the cold food chain and opportunities for improvement](#), 2020.

<sup>88</sup> IEA | UN Environment Programme, [Cooling emissions and policy synthesis report](#), 2020, citing Project Drawdown 2017.

# Case Studies

## ANNA YALLOP: BIORESOURCE PROCESSING ALLIANCE



NZ Champion of 12.3 Anna Yallop is the Bioresource Processing Alliance (BPA) General Manager.

BPA is a Ministry of Business Innovation and Employment (MBIE) funded programme established in 2012 to take primary sector biological by-products and turn them into valuable export products. BPA does that by co-funding and undertaking the research and development alongside companies who want to develop these products. It is a collaborative programme involving researchers from Scion, Plant & Food, Callaghan Innovation, AgResearch and Universities.

Anna wants to see food producers and manufacturers exploring by-product utilisation, known in recent years as “upcycling”. Upcycling involves turning by-products into food innovations such as ingredients, functional foods, nutraceuticals and high value pet foods. Anna says the benefit of upcycling biological by-products include saving costs, generating revenue for NZ, reducing the amount of food going to landfill and extending product ranges for consumers.

One example is New Zealand King Salmon (NZKS) who used human food grade salmon by-products to develop a range of pet treats for a new division within the company: OmegaPlus. Advantages of partnering with the BPA include the BPA teams project managing the projects to enable companies to carry on with their core business, and the BPA de-risks the early stage exploration of by-product utilisation. You can read more here: <https://bioresourceprocessing.co.nz>

# Case Studies

## JAMES GRIFFIN: SUSTAINABLE BUSINESS NETWORK – GOOD FOOD BOOST



Sustainable Business Network (SBN) is a network of diverse organisations who are working towards a more sustainable future. They deploy interventions in three key areas: climate action, circular economy and regenerative nature.

Their circular economy work includes the Good Food Boost (in partnership with Auckland Unlimited and Wellington City Council), which is a free mentoring programme to provide support and guidance from leading mentors to give good food businesses a boost. The programme is now in its fourth year and has proven to deliver tangible benefits across distribution, production, commercialisation and strategy. NZ Champion of 12.3, James Griffin, provides mentoring advice on key environmental sustainability aspects such as packaging, GHG emissions, regenerating nature and waste. SBN is calling for more applicants in future years: <https://sustainable.org.nz/good-food-boost/>

As mentioned above, SBN has also played a critical research role with a study in 2017 on manufacturing businesses and opportunities for reducing food waste or finding values channels away from animal feed. SBN is looking into a broader circular economy business voluntary commitment and James is highly supportive of NZ Food Waste Champions' work to bring a food waste specific voluntary commitment to fruition.



GOOD

FOOD BOOST

# Case Studies

## MIRANDA MIROSA: UNIVERSITY OF OTAGO, FOOD WASTE INNOVATION



*Food Waste Innovation Theme Steering Committee,  
AP Miranda Mirosa, Prof Phil Bremer, Prof Sheila Skeaff.*

The Food Waste Innovation Research Theme was launched in 2020 at the University of Otago. It involves interdisciplinary researchers who are looking to find solutions to food waste problems across the whole supply chain. Although research in this space at the University is not new, the aim of the theme is to achieve better coordination amongst individual researchers, acknowledge food waste as a strategic area of importance, and better engage other researchers, industry and the public.

The Theme's three sub-themes are metrics and management, technical innovation and social innovation. A great example of the University's expertise being put to use is in the emerging area of upcycled foods. The Food Waste Innovation's Upcycled Food Lab has researchers working with industry to develop new upcycled food products. As an example of work in this space, Food Scientists in collaboration with Citizen Collective, recently set out to explore the maximum amount of wasted bread that could be substituted into a good tasting beer by developing a unique mashing regime. The Upcycled Lab's social scientists have recently published research detailing Kiwi's willingness to purchase such products, as well as a guide for upcycled food manufacturers on how to get their innovative products onto supermarket shelves.

The theme's Director, Associate Professor Miranda Mirosa, and NZ Champions of 12.3 Co-Chair, has strong ties not only in the academic food waste community, but with industry as well as government action. Most notably Miranda authored 'the Mirosa Report' as the expert advisor for the Environment Select Committee's investigation into food waste in 2019-2020: <https://www.otago.ac.nz/food-science/news/otago736320.html>

The Theme welcomes research proposals and partnerships so please get in touch here: [food.waste@otago.ac.nz](mailto:food.waste@otago.ac.nz) or <https://foodwaste-otago.org/>.

# Retail



# RETAIL

*“We call on other businesses to also report their food waste data; this is the only way that we’ll know whether the UK and the world is on course to reach SDG Target 12.3”*

*- Tesco CEO and Chairman of Champions 12.3, Dave Lewis<sup>89</sup>*

## OVERVIEW

The unique placement of retailers, right in the centre of farm and fork, means they can influence the rest of the supply chain. Retailers also have a critical role in preventing food wastage in the first place, to meet their bottom line, and to redistribute any surplus to local communities. Retailers have an opportunity to take a leadership role and we are pleased to have had representatives from both leading retail companies, Countdown (main sponsor) and Foodstuffs, on our NZ Champions of 12.3 coalition. We are particularly grateful for Countdown’s financial support in NZ Food Waste Champions’ first year of operations.

We interviewed five retailers, with findings from four: Totally Local, Commonsense, Moore Wilsons and the Otago Farmers Market, for their insights on food waste reduction at the retail stage.

## DATA

Research in 2017 found that supermarkets create 60,500 tonnes of unsold food annually.<sup>90</sup> Of that, 38% is technically “wasted”: with 23% being sent to landfill (13,915 tonnes), 14% to protein reprocessing and 1% composted. The rest is used for animal feed (46%) or donated to food rescue groups (15%). Fresh fruit and vegetables contributes to 44% of wasted and diverted product in supermarkets. Of the food sent to landfill, the largest contributors are dairy products, bakery, and meat and fish.

Overseas, in the United States, it is estimated that 10% of 43 billion pounds of food in grocery stores will never make it off the shelf and 30% of a grocery store’s trash is food waste.<sup>91</sup> The Tesco Retail Chain has sent zero waste to landfill since 2009.<sup>92</sup> Our per capita food waste rate at the retail level appears to be better than other countries, producing almost half the per capita food waste of estimates recorded for Europe.<sup>93</sup> But improvements can still be made.

<sup>89</sup> Tesco [“Tesco calls for more businesses to publish food waste data as amount of food wasted in Tesco is down 17%”](#), 14 May 2019.

<sup>90</sup> Francesca Goodman-Smith, [A quantitative and qualitative study of retail food waste in New Zealand](#) (Thesis Master of Science, University of Otago, Dunedin), January 2018.

<sup>91</sup> Quest [“Food Waste Statistics, The Reality of Food Waste”](#)

<sup>92</sup> Tesco [“Our approach to managing waste from our UK operations”](#), 2020.

<sup>93</sup> Francesca Goodman-Smith, above n 90, at 99.

# BARRIERS

## TRAINING AND EDUCATION

Training and education was a significant problem outlined in NZ's main study on retail food waste.<sup>94</sup> There is also high turnover of staff in the retail sector and they are often time poor and on low wages, without incentives to separate food from waste.

## FOOD SAFETY

Despite the 'Good Samaritan' clause in the New Zealand Food Act 2014, which absolves criminal liability if the food is safe at the time of donation, retailers may be cautious about food safety when deciding whether to donate food.

## MEETING CONSUMER DEMANDS

Retailers argue they are expected to meet the high quality consumer demands of consumers. Moore Wilsons also identified that consumers tend to expect lots of produce to be on their shelves. One study has found that some retailers over-cater by more than 7% to ensure that customers' needs are met.<sup>95</sup> Moreover, people want produce to be available all year rather than eating seasonally, which not only puts pressure on imports but increases the likelihood of wastage.

## PARTICULAR PRODUCT BARRIERS

Many supermarkets struggle with diverting dairy due to its temperature sensitivity. There is also over-production of bakery waste, which contributes to 23% of total food waste and diversion at a retail level. WasteMINZ has identified bread in particular as the number one wasted food product by New Zealand households, at around 20 million loaves a year.<sup>96</sup> The food rescue market is over-saturated with bakery product, many of whom refuse bread from retailers. Another problematic item identified by Commonsense Organics is meat, as it cannot be composted.

## BUSINESS MODEL

The high volume-low margin business model of supermarkets makes them vulnerable to threats such as competition, increasing wholesale prices and changing consumer demands.<sup>97</sup>

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<sup>94</sup> Francesca Goodman-Smith, above n 90, at 101.

<sup>95</sup> Francesca Goodman-Smith, above n 90 citing Eriksson M. Retail Food Wastage: A case study approach to quantities and causes department of energy and technology. Department of Energy and Technology: Swedish University of Agricultural Sciences, 2012

<sup>96</sup> WasteMINZ "[Love Food Hate Waste](#)" 2016.

<sup>97</sup> Yasemin Y. Kor, Jaideep Prabhu and Mark Esposito "[How Large Food Retailers Can Help Solve the Food Waste Crisis](#)" Harvard Business Review, December 2018.

## OPPORTUNITIES

### For Government and Retailers:

#### INCREASING CAPACITY OF FOOD RESCUE SECTOR

Increasing the capacity of the food rescue sector has been identified as a necessary step by academics<sup>98</sup> and those within the sector.<sup>99</sup> In 2019, the Government (MSD) invested in setting up the New Zealand Food Network (Case Study 1) and the Aotearoa Food Rescue Alliance (AFRA) (Case Study 8), to increase the amount of food going to people in need and to increase the capacity of food rescue organisations. Kore Hiakai is another national organisation that has received support from MSD to address the root causes of food insecurity in NZ. However, the two year grants for each organisation are a limitation. Government should continue to explore options for funding these three national NGO partners, and MFE should potentially contribute through the Waste Minimisation Fund, particularly for AFRA and New Zealand Food Network.

Countdown has made significant donations to their partners through a contestable fund.<sup>100</sup> In 2019, Foodstuffs NZ donated around \$1 million to support food rescue and other charities as a result of Covid-19.<sup>101</sup> Retailers may also wish to consider increasing their current contributions to the food rescue sector. The benefits include boosting reputation for customer loyalty, diverting waste to a value stream and feeding NZ communities.

#### VOLUNTARY COMMITMENT

We introduced the concept of a Voluntary Commitment in the “Primary Production” chapter, where businesses collectively agree to a Target, Measure, Act approach – with government funding and support. In the UK, 85% of retailers signed the Courtauld Commitment by 2016, with an agreed target of a 20% reduction in all food and drink waste by 2025.<sup>102</sup> Businesses implementing the Target, Measure, Act approach across are already seeing the benefits. For example 45 businesses with public data had seen a 17% reduction in food waste (worth 300 million pounds) compared to the previous year.<sup>103</sup> The NZ Government and our leading retailers need to turn to these overseas examples of voluntary commitments – existing in over 30 different countries. Retailers in particular could play a leadership role in being first signatories and publishing publicly their data. Positively, Countdown and Foodstuffs both have targets of zero waste to landfill by 2025.

<sup>98</sup> Francesca Goodman Smith, above n 90.

<sup>99</sup> Kaibosh and KiwiHarvest submissions to the Environment Select Committee, [Briefing to investigate food waste in New Zealand](#), March 2020.

<sup>100</sup> Countdown “[Food rescue charities to focus on expansion with new funding](#)” 26 March 2019 In total, Countdown has gifted over \$435,000 to food rescue partners.

<sup>101</sup> Foodstuffs NZ “[Foodstuffs’ \\$1 million donation to support more than 30 charities across New Zealand](#)” 5 May 2020

<sup>102</sup> WRAP “[Courtauld Commitment 2025 signatories and supporters](#)”

<sup>103</sup> WRAP “[Food Waste Reduction Roadmap Progress Report 2020](#)”, 2020.

## For Retailers:

### THE BUSINESS CASE

From a business perspective, reducing food waste will increase profits. As one interviewee noted, “our entire business is focused on waste because it doesn’t make any sense for us to waste food”. It is for this simple reason that reducing food waste is an opportunity for supermarkets.

### PARTICULAR PRODUCT SOLUTIONS

Some particular product solutions are identified below:

- Dairy: the collection of dairy waste for reformulation
- Meat and fish: protein reprocessing bins
- Bread: increased research and better forecasting
- Eggs: replacing individual cracked eggs so that a store can retain the entire carton
- “Ugly” produce: Case Study 6

### TRAINING AND EDUCATION

Training and educating staff to follow systems that reduce food waste should be a priority for the retail sector. One author has recommended an in-store reward based system to motivate staff to follow waste management procedures.<sup>104</sup> Incorporating specific courses on food waste into employee training programmes e.g. Light Blue<sup>105</sup> will increase awareness and encourage staff to contribute to the solution. Visiting local food rescue charities and building in-person connections may also assist. Beyond staff training, Commonsense Organics noted the importance of the wider educational piece to both consumers and staff. “Food waste comes from a lack of support for those who deal with food and a lack of respect of food. These are all skills that need to be bought back into our education system”.

### INFLUENCING CONSUMERS

Sainsbury’s (UK) research shows that consumers view supermarkets as a source of inspiration and guidance for reducing food waste.<sup>106</sup> Consumer awareness techniques include: sharing recipes, free food magazines (with zero waste tips), sponsoring chefs to demonstrate how to utilise leftover ingredients or running marketing campaigns. Portioning correctly is another area for delivery outlets who need to be careful around portioning so households are not getting more than what they need. There are associated benefits for retailers in considering these food waste reduction, such as gaining customer loyalty and cost savings. In one United States grocery retailer experiment, new ways to display produce not only reduced stock levels but ended up boosting customer satisfaction because produce stayed fresh for longer. Estimated savings of \$100 million per year were made by that retailer.<sup>107</sup>

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<sup>104</sup> Gruber V, Holweg C, Teller C. What a Waste! Exploring the Human Reality of Food Waste from the Store Manager’s Perspective *J Public Policy* Mark 2016 35:3-25.

<sup>105</sup> [Light Blue Consulting](#)

<sup>106</sup> Sainsbury’s “[Modern Life is Rubbish](#)” 6 September 2016.

<sup>107</sup> Dana Gunders *Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill* (Natural Resources Defense Council, August 2012 AP 12-06-B) p 11.

## LOCAL RETAIL MARKETS

We spoke with two local retailers, Totally Local and the Otago Farmers Market Both highlighted the value in buying local and bringing the community on board to a low-waste model. For example, the Otago Farmers Market noted their shorter supply chain, which naturally lends to a strong ethos of not wasting. “They work hard to grow the food and bring it to your market so it is closer to the bone to waste food when you have pulled it out of the ground yourself”. In addition, a local market chef uses surplus from vendors, to create interesting meals for people roaming the markets. Not only is this a highly educative model, there is also a return on sales. Totally Local was set up in the wake of Covid-19 and its mission is to connect consumers with the best food from trusted producers in the area through an e-commerce platform. Totally Local argue that local networks are more sustainable as food will get to people quicker and wastage is prevented.

## FORECASTING AND ORDERING TECHNOLOGY

Investing in new technology can reduce excess inventory and handling. As one interviewee suggested, businesses should be constantly forecasting to see if they are prepared as well as possible. As discussed above, technologies such as Fresho can help with accurate ordering and planning (Processing Chapter).

## BUYER SPECIFICATIONS AND WORKING CLOSELY WITH FARMERS

Supermarkets have traditionally embraced high cosmetic standards for fruit and vegetables, leaving imperfect or “ugly” fruit to waste. Retailers should look at buyer specifications and think about how to relax their standards and encourage grade B produce sections. At the least, retailers should be still selling “ugly” fruit and vegetables at discount prices (Case Study 6). If farmers and retailers work more closely together, or if intermediaries are encouraged to lessen the gap, agricultural food waste can be reduced. Food retailers can be more systematic in sharing their forecast data on specific food items to help farmers with their production plans.<sup>108</sup> They can also share productivity-enhancing knowledge. For example, Sainsbury’s in the United Kingdom worked with sheep farmers to extend the lamb season by five weeks in 2015, boosting availability of lamb for consumers and prevention potential farm losses.<sup>109</sup>

## PACKAGING AND COMPOSTING

Retailers can experiment with better packaging technology to extend the product life of their own products. For example, Commonsense Organics use compostable packaging and are connected with local community composting groups, like Kaicycle. Commonsense highlighted the important role of local councils in encouraging local composting models for retailers. Anaerobic digestion could then be good for meat or difficult to compost items.

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<sup>108</sup> Yasemin Y. Kor, Jaideep Prabhu and Mark Esposito “How Large Food Retailers Can Help Solve the Food Waste Crisis” Harvard Business Review, December 2018 <https://hbr.org/2017/12/how-large-food-retailers-can-help-solve-the-food-waste-crisis>

<sup>109</sup> “Sainsbury’s makes British lamb commitment” 6 May 2016 <https://www.about.sainsburys.co.uk/news/latest-news/2016/06-05-2016-a>

# Case Studies

**KATE PORTER:**  
COUNTDOWN, ODD  
BUNCH



Countdown sells “ugly” fruit and vegetables at a national scale for a lower price. This initiative is the first of its kind in New Zealand to help cut food waste, use more produce from local growers and make healthy food more affordable: <https://www.countdown.co.nz/helping-you-save/the-odd-bunch>

Countdown recently expanded its “Odd Bunch” programme by trialling the online purchase of boxes of mixed fruit and vegetables in November 2020. While the produce is seasonal, the range has increased with avocados, strawberries and tomatoes.<sup>110</sup>

Countdown NZ Champion of 12.3 Kate Porter (Communications & Community Lead) says that “Odd Bunch has gone from strength to strength” since it was introduced in 2017. She says it is about delivering value back to the grower and building on Countdown’s unique and direct relationships with growers. Kate herself will more often than not purchase from the Odd Bunch produce.

Kate and Countdown are looking at expanding its Odd Bunch programme, further encouraging consumers not to waste and challenging demands for perfect-looking produce.

The Odd Bunch initiative by Countdown compliments its support for New Zealand Food Waste Champions, being our main sponsor since launching. We can’t thank them enough.

**LOOKS  
ODD  
TASTES  
GREAT**



<sup>110</sup> Debrin Foxcroft “Ugly fruit to your door: Countdown trials fruit and veg box home delivery” 2 November 2020 <https://www.stuff.co.nz/business/industries/123250189/ugly-fruit-to-your-door-countdown-trials-fruit-and-veg-box-home-delivery>

# Case Studies

## FRANCESCA GOODMAN SMITH: FOODSTUFFS, UPCYCLING



Foodstuffs are a co-operative of owner-operated stores including New World and PAK'nSAVE, as well as some distribution centres, convenient stores and liquor outlets. Previous NZ Champion of 12.3 Francesca Goodman Smith ran the waste minimisation programme across all of these stores but has since moved to Australia's Fight Food Waste Cooperative Research Centre.

In 2012, Foodstuffs undertook audits to create a waste diversion baseline. It was found that 64% of waste was diverted from landfill which has now increased to 85% of waste is diverted through efforts of the Waste Minimisation Programme. In terms of surplus food, most is diverted to food rescue organisations (9 million meal equivalents were donated in 2020), animals feed or compost. Foodstuffs has a target to send zero food waste to landfill by 2025, currently retail sector figures indicate approximately 23% of food waste in the sector goes to landfill. Francesca notes the importance of good data and technology to continually improve practices, as Foodstuffs has done. Francesca says, "We need to keep pushing the boundaries ... it's about looking for those big, game-changing ideas and going for it".

One area Francesca is particularly passionate about is Foodstuffs' unique positioning in the upcycled food space. "We're tackling that from lots of different directions. For example, our bread from our stores is going to make Citizen Collective's upcycled craft beer and our meat is going to make Perfect Deli Fresh dog rolls." Foodstuffs has also partnered with the University of Otago to understand consumer perceptions of upcycled foods – finding that although only 10% of customers had heard of upcycled food before, 81% were willing to try or buy upcycled foods after the concept was explained. Globally, the upcycled food sector is valued at \$46.5 billion dollars and is "going a long way to shift the value proposition of what waste is".

# Case Studies

## MATT DAGGER: AOTEAROA FOOD RESCUE ALLIANCE AND KAIBOSH



Champion Matt Dagger is the General Manager of food rescue charity Kaibosh, who partners with both Countdown and Foodstuffs NZ. Having started operations in central Wellington 12 years ago, Kaibosh has since expanded to the Hutt Valley (2016) and Kāpiti Coast (2019). Kaibosh takes surplus food, mostly from the retail sector, and redistributes it to social service agencies and people in need. Kaibosh has a unique philosophy of prioritising nutritious food – specifically aiming for 70% of its food to be fresh fruit and vegetables, dairy or meat. Kaibosh has rescued 1,842,425kg of food, provided 5,264,071 meals and reduced 665,115kg of carbon emissions.

Kaibosh is one of 19 food rescue charities who are part of the Aotearoa Food Rescue Alliance (AFRA) <https://www.afra.org.nz>, serving local communities around the country. Matt is also the Chair of this new alliance, providing national support to local food rescue organisations to reduce food waste and increase food security. Supported by the Ministry for Social Development, the alliance has four goals: capacity building, advocacy, best practice and collaboration.

Matt notes Kaibosh's success is due in large to dedicated people. For example, Kate and Francesca have championed Kaibosh internally to drive thriving partnerships. "Also storemen at individual stores. If there is a produce manager who is engaged, this makes all the difference". Volunteers are integral to Kaibosh, sorting and packing rescued food – 90% of which would otherwise end up going to animal farms or worse, landfills. Politicians like Angie Warren-Clark MP who have championed the food waste issue have also made a difference. To read more about Kaibosh, view their website: <https://www.kaibosh.org.nz>

# Hospitality



# HOSPITALITY

*“Many of the items that we consider ‘waste’ are culinary staples in other cultures because people have found a way to make them delicious through good cooking”*

- Chef Dan Barber<sup>111</sup>

## OVERVIEW

Food waste reduction in the hospitality and food service sector is starting to get on the menu. While there is increasing interest in food waste reduction as a cost-saving and sustainability objective, bespoke resources for New Zealand food services are lacking and focus is being diverted to simply getting food on the table, particularly after the impacts of Covid-19.

We interviewed five stakeholders in the hospitality space, including industry body Hospitality NZ, food system advocacy organisation Eat New Zealand, artisan bakery industry body Baking Industry Association NZ (BIANZ), compost collection service Green Gorilla | We Compost, and a manager in the hospitality industry who has been involved in ventures such as zero waste restaurant Bird on a Wire and hospitality consultancy Delicious Business.

## DATA

Internationally, food waste in the hospitality and food service sector is estimated as making up 12% of total food waste.<sup>112</sup> However, many have noted the lack of academic literature and data to make this figure anything but an estimate.<sup>113</sup> In the United Kingdom, a more accurate study shows that 18% of food purchased by the UK hospitality and food service sector is thrown away.<sup>114</sup>

Waste audits in New Zealand cafes and restaurants in 2016 found that those industries collectively throw away 24,372 tonnes of food annually, 61% of which is avoidable.<sup>115</sup> Unlike the United States where plate waste is most common, most of our waste is in preparation (60%), around a third is customer plate waste and then a small amount is due to spoil (7%).

Consumers are starting to consider food waste when choosing a restaurant. A study by Unilever revealed that 72% of United States’ diners care about how restaurants handle food waste and 47% would be willing to spend more to eat at a restaurant with an active food recovery programme.<sup>116</sup>

<sup>111</sup> No Waste Nutrition [“100+ Food Waste Quotes to Inspire a Sustainable Kitchen!”](#)

<sup>112</sup> Amandeep Dhir, Shalini Talwar, Puneet Kaur and Areej Malibari, [Food waste in hospitality and food services](#), October 2020.

<sup>113</sup> Amandeep Dhir, above n 112.

<sup>114</sup> [Guardians of the Grub](#) and WRAP, [UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3](#), 2020 .

<sup>115</sup> WasteMINZ, [Food Waste in the Cafe & Restaurant Sector in NZ](#), 2016.

<sup>116</sup> ReFED, [Restaurant Food Waste Action Guide](#), 2018.

## BARRIERS

### FEAR AROUND GIVING AWAY FOOD

Hospitality providers are reluctant to pass on food that is not fit for sale, but still fit for human consumption. There are a number of reasons for this. First, there is a fear that giving away food for free or heavily discounted will result in less sales for the business. Second, there is a fear of liability if someone was to get sick- therefore businesses take unnecessary precautions or do not feel comfortable passing the food onto a third party (such as a food rescue) to distribute. Both of these fears are 'debunked' below.

### MISREPRESENTED VOLUMES OF WASTE

Mixed methods studies, which collected both audited and self reported waste volumes of food waste in restaurants and cafes found that businesses tended to significantly underestimate the amount of waste their business was generating.<sup>117</sup> As a result, many of these businesses noted that they were content with current waste prevention and management practices and saw no need to address food waste. Lack of evidence based understanding may be contributing to businesses' lack of motivation to reduce food waste generation.

### EASE OF ENGAGEMENT

Hospitality businesses, particularly small businesses, operate in a fast-paced, low margins environment which means they lack time to think about anything not seen as central to their service. Interviewees reported this acts a huge barrier for businesses engaging with food rescues or waste management services, such as animal feed and composting, simply because they lacked the time to engage with more than one entity regarding their waste. Factors preventing ease of engagement, including a lack of space for waste collection, training and separating waste into multiple streams contribute to a lack of engagement. It needs to be easier.

### BUY-IN FROM STAFF & CONSUMERS

Food waste prevention and management systems require training and buy-in from all kitchen employees. This means that even if a manager or chef is motivated to think about food waste, if this is not shared among the staff and built into their training, the systems may not be implemented properly. Buy-in from consumers is another alleged barrier - particularly affluent diners who have high expectations around what is acceptable food. Consumer expectations around eating all types of food throughout the year is also challenging.

### UNKNOWN DEMAND

The nature of the hospitality industry is that demand fluctuates from week to week, day to day and hour to hour. Interviewees noted it can be difficult to accurately predict demand. The industry norm is to over produce to mitigate the risk of running out of food, which in turn increases the potential for waste. This means that sustainability, in one interviewees words, becomes a "nice to have, not a need to have, especially in the current economic climate".

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<sup>117</sup> Miroso, M., Mainvil, L., Chisnall, S., Jones, E., and Marshall, J., 2018b. Foodwaste in the Cafe & Restaurant Sector in New Zealand, Auckland: WasteMINZ; Chisnall, S. J. (2018). A Taste for Consumption: Food Waste Generation in New Zealand Cafés and Restaurants. In M. Miroso & L. Mainvil (Eds.).

### For Government | Hospitality

#### MEASURING

Given that hospitality is largely unaware of how much food waste it is generating, a key step towards reduction is measurement. As mentioned above, Government should support a Voluntary Commitment to encourage businesses to measure their food waste, including a bespoke hospitality agreement. This could lead to the development of universal toolkits, or consultancy services, for businesses to evaluate their food waste prevention and management systems.

#### HOSPITALITY CAMPAIGN

Following international leadership and resources, there is an opportunity to bring a widespread hospitality food waste reduction campaign to New Zealand. For example, the *Guardians of the Grub* campaign in the United Kingdom was set up to tackle the 3 billion pounds worth of food being wasted by hospitality and food service outlets. That campaign has a series of case studies, to highlight successful initiatives, and resources to guide the hospitality sector into doing the right thing.<sup>118</sup> The Target, Measure Act approach (referred to in earlier chapters) is at the heart of the campaign's advice. The Waste Minimisation Fund, with its specific investment signal around "improved tools to avoid food waste", could be well-placed to invest in a national campaign.

#### BUSINESS/ CASE STUDIES

In 2018 and 2019, the Global Champions of 12.3 published a series of business cases to encourage various parts of the sector to reduce their food waste including for restaurants and cafes, catering services, and hotels. These reports found that over a three year period, businesses saved an average of between \$6 and \$7 for every \$1 invested in food waste reduction.<sup>119</sup> NZ research shows that the biggest motivation for cafes and restaurants to reduce food waste is financial. The Government/ hospitality sector/ NZ Food Waste Champions 12.3 should be sharing these resources more widely. There is also the opportunity to develop and share more case studies, such as Everybody Eats (Case Study 9) and others e.g. Sky City's efforts to reduce food waste.<sup>120</sup>

#### WASTE-FREE RATINGS

One interviewee noted potential value in creating a "Reduces Food Waste" ranking for hospitality businesses, similar to food safety gradings under Food Act 2014 requirements.<sup>121</sup> This would showcase businesses that are implementing strong food waste reduction practices (high ranking) versus those that are not doing anything around food waste (low ranking). The app CoGo has started this journey with its "Reduces Waste" badge. However, there are no official verification partners under this badge, unlike other areas such as "Living Wage" and "Carbon Conscious"<sup>122</sup>. It is also worth considering whether wider waste-free practices could be part of this ranking system.

<sup>118</sup> [Guardians of the Grub](#)

<sup>119</sup> Champions of 12.3, "[The Business Case for Food Loss and Waste Reduction](#)"

<sup>120</sup> Sustainable Tourism, "[SkyCity Solves a 500-tonne food waste problem](#)"

<sup>121</sup> For example, Auckland Council "[Understanding food grades](#)"

<sup>122</sup> [CoGo](#)

## For Hospitality:

### STAFF EDUCATION/TRAINING

As well as toolkits for evaluating food waste prevention and management systems, external training programs or resources for effective waste reduction strategies could be developed and distributed to hospitality businesses. Our Hospitality NZ interviewee noted that a simple food waste reduction checklist for staff could go a long way and that there's some great private sector initiatives out there. Guidelines for hospitality should focus on evidence-based strategies such as measurement and monitoring, staff engagement, reducing overproduction, improving inventory and purchasing practices, and designing out waste streams based on the food waste hierarchy.

### MORE WASTE FRIENDLY SERVICE MODELS

Certain service models, mentioned either anecdotally by interviewees or in existing literature, are attributed to reducing food waste in hospitality businesses.

- Set menus: one interviewee noted these decrease the guesswork of the kitchen and limit the number of ingredients that need to be prepared.
- Avoiding buffets: these involve a lot of guess-work. Any leftovers are unlikely to be used due to increased health and safety concerns when dealing and redistributing cooked.
- Made-to-order meals: tend to produce less food waste than other models ready-made food or buffets.

### EMBRACING FOOD REDISTRIBUTION

Despite a fear around discounted/ free food putting people off, one interviewee said that their experience was the opposite. Providing discounted food meant that people visited their store that may not have otherwise come in – some ending up as repeat customers. BIANZ also highlighted in their interview the value of the Good Samaritan Clause but unfortunately, “people do not know it is even there”. As mentioned above, this clause allows food businesses to pass on food without liability so long as it is safe at the time they pass it on, and on the condition that the food is not on-sold. Apps like Foodprint provide an option for eateries wanting to connect surplus to consumers.<sup>123</sup> There are also number of “Free Store” food rescue models around the country that readily partner with hospitality e.g. Just Zilch, Kairos Free Store and Wellington Free Store.<sup>124</sup>

### COMPOSTING

Where food waste is unable to be prevented or redistributed to people, composting is a preferable option to throwing food in the bin. Green Gorilla has started offering “We Compost” to a number of businesses in the Auckland region. They service a number of hospitality outlets and overall, they're diverting around 50 tonnes of food each week. Green Gorilla noted the importance of working with industry to ensure waste facilities are well thought-out and that there is room for composting pick-ups. Hospitality organisations should look into what composting collection services exist in their local area and organisations like Government agencies or NZ Food Waste Champions 12.3 could assist with mapping out these services.

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<sup>123</sup> [Foodprint](#)

<sup>124</sup> Aotearoa Food Rescue Alliance, “[Members](#)”.

## For Hospitality and Consumers:

### PORTION & PLATE SIZES

Hospitality businesses should adopt various strategies to reduce plate waste. First, hospitality can reduce portion and plate sizes. Research shows that making smaller portions on smaller plates is a good way to reduce plate waste left by customers. Norms around portion sizes are often not in line with health guidelines for serving sizes. In a recent survey, 79% of respondents said they are open to less options on the menu to reduce food waste and 79% said they were open to smaller portion sizes for the same reason.<sup>125</sup> A flexible menu with portion options may also help consumers to eat everything on their plate. There is, however, a risk that this could instead cause preparation waste, because of the increase in uncertainty for the kitchen.

### OFFER “DOGGY BAG” SERVICES

Hospitality businesses should offer “doggy bag” services. For example, Wellington-based Reusabowl provides reusable packaging for eateries. Consumers can borrow a reusable bowl for \$10 from a partner eatery to take their leftovers, the return it to the eatery once they’re done with it and get a full refund.<sup>126</sup> The “Goodie Box” is another recently launched open that encourages restaurant goers to embrace taking leftovers home.<sup>127</sup> A recent survey by Love Food Hate Waste found that 87% of respondents wanted to be offered a doggy bag if they couldn’t finish their meal, but only 5% of them had ever been brave enough to ask for one. Having a “doggy bag” service on show could help join the dots for consumers wanting to waste less.<sup>128</sup>

### CELEBRATE AVAILABLE & LOCAL INGREDIENTS

Although interviewees noted that chefs are getting more creative with utilising all portions of ingredients, and locally sourced produce, there is more that could be done. Another way for chefs to reduce preparation waste is to create specials based on the ingredients in their kitchen that needs using. During the Food Waste Summit workshops, many people noted the importance of cooking to the seasons and using ingredients that are available at that time of the year, and locally sourced. Having fun with “ugly” fruit and vegetables is another option for bold restaurant owners/ chefs who are willing to challenge consumer expectations and ultimately create new trends. The transformation of attitudes towards food is key to the organisation, Eat NZ. It is worth following their movement to explore eateries that have a locally produced ethos.<sup>129</sup>

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<sup>125</sup> Sodexo Food Waste Consumer Insights Research, [Executive Summary](#), 2020.

<sup>126</sup> [Reusabowl](#)

<sup>127</sup> Denizen, [“Everybody Eats continues its fight against food poverty with a thoughtful new initiative”](#), April 2021.

<sup>128</sup> Stuff [“Everybody Eats launches modern doggy bag in effort to reduce plate wastage”](#), April 2021.

<sup>129</sup> [Eat NZ](#)

# Case Studies

## NICK LOOSLEY: EVERYBODY EATS



Everybody Eats is a charitable dining concept which began in 2017 as a pop-up in Auckland Central. There are now three pop-ups in Auckland, Papamoa and Wellington, as well as a permanent restaurant in Onehunga. With the help of volunteers, including top chefs, they use the rescued food to create restaurant quality three course meals. Some customers pay for their meals, which subsidises those who are unable to.

NZ Champion of 12.3 Nick Loosely, who is the founder and manager of the initiative, explains that the concept has three main purposes, one of which is to reduce food waste. They do this by utilising rescued food and operating with a set-menu, taking the guesswork out of food preparation.

Other focuses are to reduce food poverty, and to stimulate social organisation by having a wide cross section of the community dining together who might not normally cross paths. Nick has plans for more pop-ups around the country. They are also looking at opening another permanent restaurant in Auckland, and one in Wellington.

Nick has many ideas to reduce food waste in the hospitality sector, including getting rid of buffets, managing expectations, portion sizes, diversion to either people or pig farms and exploring new technologies like Foodprint. Everybody Eats is one of these amazing solutions: <https://everybodyeats.nz>

Post-script: Please note MPI rules around feeding food waste to pigs: <https://www.mpi.govt.nz/animals/animal-feed-preventing-disease-transfer/feeding-food-waste-to-pigs-and-preventing-disease/>

# Household



# HOUSEHOLD

*“He aha te kai a te rangatira? He kōrero, he kōrero, he kōrero | What is the food of the leader? It is knowledge, it is communication”*

Māori Whakatauki<sup>130</sup>

## OVERVIEW

Household food waste is the most significant volume across the food supply chain. This is particularly problematic, given that the further towards the end of the supply chain food waste occurs, the greater the environmental impacts. Globally, 88% of consumers agree food waste is an important environmental action.<sup>131</sup>

We interviewed five organisations invested in addressing household food waste, including two council waste management officers (Porirua City Council and Queenstown Lakes District Council), a waste management company Envirowaste, an educational not for profit Compost Collective and localised composting and urban farming not for profit Kaicycle.

## DATA

The United Nations estimate that up to 61% of food waste comes from the household level. This equates to 570 million tonnes of waste occurring at household level each year and a global average of 74 kg per capita.<sup>132</sup> However, this international data should be treated carefully due to the data gaps in other areas of the supply chain, such as primary production and transport.

In New Zealand, as part of their ‘National Food Waste Prevention Project’, WasteMINZ conducted a nationwide bin audit in 2018 to quantify household food waste and found that 157,398 tonnes of avoidable household food waste is being landfilled each year. That equates to 86 kg per household per annum, equivalent to three shopping trolleys and costing around \$644.<sup>133</sup> That amount of food is enough to feed the whole of Dunedin for just under three years and to offset the emissions, 163,693 trees would need to be planted. Another study estimated that in 2011, New Zealand households sent over 224,000 tonnes of food to landfill. This study also looked at the impacts of this waste, noting that edible food waste sent to landfill could feed between 50,000 and 80,000 people a year and embodies  $4.2 \times 10^6$  tonnes of CO<sub>2</sub>-e,  $4.7 \times 10^9$  m<sup>3</sup> of water, and  $29 \times 10^3$  TJ of energy.<sup>134</sup>

<sup>130</sup> University of Otago [“Ko te kai a te rangatira, he kōrero”](#)

<sup>131</sup> Sodexo Food Waste Consumer Insights Research, [Executive Summary](#), 2020.

<sup>132</sup> United Nations Environment Programme, [Food Waste Index Report 2021](#), March 2021.

<sup>133</sup> LFHW [“Don’t Let Food Go to Waste”](#), 2018.

<sup>134</sup> Christian Reynolds, Miranda Miroso, Brent Clothier, [New Zealand’s Food Waste: Estimating the Tonnes, Value, Calories and Resources Wasted](#), *Agriculture*, 2016.

## BARRIERS

### LACK OF UNDERSTANDING

Although the Love Food Hate Waste (LFHW) campaign has helped with this issue, there is still a lack of understanding in the general public about both the techniques of food waste prevention and of their benefits (economically, socially and environmentally). One interviewee noted that while a general campaign (LFHW) has been good, diverse communities means that not every household takes this on board in the same way so a 'one size fits all' campaign has limited effects. One organisation said it is important not to overemphasise the benefits of composting above the benefits of waste prevention. Many attendees at the Food Waste Summit also referred to the lack of understanding as to the value of food and the resources and energy that go into making it. Most people interviewed noted that behaviour change is difficult. People form habits around how they handle their food and how they dispose of their waste, which is hard to undo.

### COST OF DIVERSION

There is not only a lack of alternative waste streams for household food waste, but the onus is also currently largely on the consumer to fork out the cost of any alternative. Currently, either households are paying for composting out of their own pocket (through home composting facilities or paying for a composting service such as Kaicycle), whereas it is cheaper for them to put it out for landfill collection. For councils, particularly small ones, "the biggest thing is collection costs". Managing contamination in kerbside recycling is also costly for councils.

### LACK OF INFRASTRUCTURE

If food waste is to be diverted from landfill, appropriate places to compost it need to be available. While this does not necessarily prevent food waste, it does prevent the negative impacts of food waste in landfill, such as methane emissions. Wellington and Queenstown Lakes council organisations both quoted a lack of large-scale composting facilities as a huge barrier to diversion from landfill. There are some local areas adopting kerbside organic waste collection, but this is not yet widespread. The lack of consistency around the country is problematic.

### COMPOSTING CONFUSION

Composting is seen to be difficult and onerous, preventing people from starting their own composting system at home. There are also knowledge gaps, creating issues around contamination of kerbside collection (particular confusion was noted around 'compostable packaging'). Misguided fear of rodents as well as odour were noted as barriers to starting home composts. In turn, both of these issues generally occur because of incorrect composting techniques and are therefore both a driver and a result of this barrier.

## OPPORTUNITIES

### For Government:

#### BAN ON FOOD WASTE TO LANDFILL

There was a level of agreement in the Food Waste Summit workshops around the Government needing to set a food waste reduction target (see this [petition](#)). Another option is to explore a ban on food waste or organics to landfill. These exist overseas, for example Ontario plans to ban all organic waste from landfills by 2022 and Sweden has a landfill ban on organic waste. In Sweden, the policy mix of landfill tax and landfill bans has been effective in diverting household waste from landfill (only around 4%).<sup>135</sup> As NZ Champion Andrew Fisher said, “Banning food waste or organics to landfill would send a huge signal to the market and allow for new investment decisions outside of existing landfills”. However, a ban needs careful exploration by the Ministry for the Environment to determine unintended consequences and sudden shocks to our waste system. A ban would also need to be matched with the right level of infrastructure for diversion (see below).

#### CONSUMER AWARENESS CAMPAIGNS ON PREVENTION

LFHW had a significant impact on food waste awareness in just a short period of three years (Case Study 12), however, the campaign lost central government funding in 2018. Interviewees and attendees at the Food Waste Summit noted that food waste prevention campaigns like LFHW need national support. It is promising that one of the Waste Minimisation Fund’s investment signals is “practical resources to inform effective behaviour change”. Interviewees also said that more targeted campaigns would be a good next step. Multi-cultural awareness techniques should be adopted and resources issued in many languages. Campaigns should include both techniques for waste prevention, as well as the benefits of prevention.

The role of the media was also highlighted as a method to incentivise food waste reduction. Having coordination staff for education campaigns will ensure engagement with the media and provide the media with passionate spokespeople on the topic. During the Food Waste Summit, engagement with schools was also emphasised as an important step to ensure good food waste reduction habits are adopted at an early age. Programmes like Garden to Table or EnviroSchools could include food waste prevention lessons and resources should be made readily available at schools. Local government should play a role here in supporting these programmes.

#### EDUCATION CAMPAIGNS ON COMPOSTING

To increase people’s willingness to home compost and to reduce the ‘myths’ around home composting, such as rodents and smell, composting education campaigns are needed. This education will increase the effectiveness of home composting and decrease contamination of kerbside collection/commercial composting. While organisations such as Compost Collective are delivering educative tools already, they rely on philanthropic investments to run their programs. A more stable, systemic approach funding composting campaigns would be beneficial.

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<sup>135</sup> OECD “[Waste Management and the Circular Economy in OECD Countries](#)”, October 2019.

## BETTER INFRASTRUCTURE FOR DIVERSION FROM LANDFILL

The Government (both central and local) needs to evaluate existing diversion models and solutions in local areas, and identify the gaps. The following questions may be useful: Should the infrastructure be private or public? Should it include kerbside collection, home composting, drop-off facilities? What scale is most appropriate? What technology is available? Factors such as the climate change benefits of diverting food out of landfill, as well as reduction in ETS charges and job creation opportunities, should be highlighted to decision makers. Making sure there are accessible and affordable options for food waste diversion from landfill is an area Government should prioritise through their Waste Minimisation Fund, which is funded through the landfill levy and is projected to increase. It is promising to see that “Achieve beneficial outcomes for organic waste” is a strategic outcome this year (2021).

## EFFECTIVE HOUSEHOLD ORGANICS COLLECTIONS

Separating organic waste at the household level provides many benefits including the the diversion of organic material from landfill and wastewater systems.<sup>136</sup> However, the level of household organics collections around the country is varied and inconsistent. Council Waste Forums provide a useful setting to put forward all of the different collection options and find out what is most effective. For example, one option for councils is to support community based initiatives, such as Kaicycle, to deliver collection and composting outcomes. The Ministry for the Environment also has a role to play here to identify the best composting infrastructure solutions. In many places, the current onus around food waste diversion sits largely with consumers, so the government needs to make this easier for consumers and roll-out household kerbside organics collections.

## For Businesses:

### EDUCATION CAMPAIGNS ON PREVENTION

Businesses can have an influential role in raising consumer awareness around food waste reduction. International experts note the importance of complementing any business efforts to reduce food waste e.g. through a Voluntary Commitment, with consumer awareness raising campaigns.<sup>137</sup> An internationally leading company in this space is Unilever. Their Hellmann’s brand encouraged 100 million customers in Brazil and beyond to see value in their fridge leftovers through “Bring Your Own Food” restaurants across the world, where celebrity chefs turned diners’ leftover ingredients into five-star meals. They note that they are “using our brands to reach consumers and help them cut waste through great products and innovative ideas”.<sup>138</sup> Previous chapters (Retail Chapter and Hospitality Chapter) also demonstrate the educative role businesses can play.

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<sup>136</sup> MfE, [Options for Kerbside Collection of Household Organic Wastes](#), 2005.

<sup>137</sup> Conversation with Mark Barthel, 2020.

<sup>138</sup> Unilever [“Tackling Food Waste”](#).

## For Households:

### INDIVIDUAL BEHAVIOUR CHANGE

Individuals and households concerned about food waste can refine their own food management practices. Some examples of simple, yet effective practices individuals can adopt include:

- Always shopping with a list;
- Keeping bread in the fridge or freezer;
- Using leftovers for the next meal.

Visit Love Food Hate Waste for tips to reducing waste at home: <https://lovefoodhatewaste.co.nz/>.

### FOOD SHARING APPS/OTHER TECHNOLOGIES

There has been a recent boom in sharing culture and apps to reduce food waste. For example, Olio connects people giving away food and other household items for free.<sup>139</sup> Too Good to Go is a food waste specific app that connects users to surplus food from food stores around them. This company is a good example of adopting wider campaigns around food waste reduction too, with additional resources for schools and companies.<sup>140</sup> In NZ, we have Foodprint, which connects consumers to surplus food nearby for a fraction of the price.<sup>141</sup> Other technologies which assist households in better managing their food should be developed and marketed with reductions in food waste in mind.

### DATE LABELLING AWARENESS

Consumers often misinterpret “best before” dates to be “use by” dates. This NZ Love Food Hate Waste summary helpfully explains the difference:



### COMPOSTING

Composting is good for the environment as it allows food to break down naturally and turns it into nutrients to feed your garden. Instead of putting food scraps in the bin, consumers can start composting immediately. The Composting Collective has excellent resources on where to start and offers courses.<sup>142</sup> Love Food Hate Waste has a guide on everything you need to know – including ratio advice on “green and brown matter”, the steps on how to compost and what can be surprisingly included (e.g. eggshells, tissues and hair).<sup>143</sup> You could alternatively utilise community composting resources where they exist, such as Kaicycle – where you simply have to put food scraps in a bucket and that will be picked up each week and taken to a local urban farm. ShareWaste NZ also connects consumers to nearby composting sites, bringing together hosts (who receive organic waste) with donors (who donate their organic waste).<sup>144</sup>

<sup>139</sup> [Olio](#)

<sup>140</sup> [Too Good To Go](#)

<sup>141</sup> [Foodprint](#)

<sup>142</sup> [Compost Collective](#)

<sup>143</sup> Love Food Hate Waste NZ “[Composting 101: Everything you need to know to get started](#)”

<sup>144</sup> [ShareWaste](#)

# Case Studies

## TE KAWA ROBB: PARA KORE



Para Kore is a kaupapa Māori organisation that supports whānau, Marae, hapū and Māori organisations to take actions to create a world without waste. Their advice ranges from understanding recycling, to building gardens and composts to grow, harvest, gather, and hunt for kai to minimise waste, build resilience, and retain traditional practices.

A big part of the work they do is to reduce food waste. Kaiārahi (Waste Advisor/Facilitator) and NZ Champion of 12.3, Te Kawa Robb explains; “Kai is a precious taonga for Māori so reducing food waste is an active way to give it the status and respect it deserves. There are some great synergies between eliminating food waste and core principles in Te Ao Maori.”

Para Kore first works to support whānau whose main focus may be simply to put food on the table, to get to a point where they have capacity to consider issues like waste reduction. Para Kore and Te Kawa believe the Government has a role to play here to: (a) take away some of the barriers to whānau’s waste reduction action, such as poverty; and (b) to create legislation that takes the onus away from whānau, and to hold producers accountable, such as product stewardship. Para Kore are looking at building relationships between marae with different skills and kai available to them (such as inland and coastal marae) and encourage food-trading between them.

Having a Kaupapa Māori voice such as Para Kore engaging Māori individuals and organisations in food waste reduction ideas and strategies, means more Māori are becoming aware the issues and are keen to participate and engage with the solution. Para Kore to date have engaged with 449 marae, 395,204 individuals, and helped to divert 522.28 tonnes of waste from landfill.



# Case Studies

## ANDREW FISHER: ECOSTOCK AND ECOGAS



EcoStock has existed for over 14 years and turns around 200T of surplus food into feed stock every day. EcoStock have helped over 100 clients divert 60 – 70% of their waste and currently employ 35 staff. NZ Champion of 12.3, Andrew Fisher says they *“match scale with scale in separating out organics from landfill, and treating it as a resource”*.

Andrew notes that part of the value of their business is the data they provide their customers through EcoTrack. *“We provide really good data, that allows clients to gain visibility of supply, production and post-production resource behaviour”*.

Andrew is also the Founder of EcoGas, which recovers resources to create sustainable biogas and biofertiliser, at a new anaerobic digestion plant in Reporoa. The particular advantage of EcoGas is in dealing with products that might not otherwise be able to be composted or turned into animal feed e.g. meat. EcoGas has secured a long-term contract with Auckland council as part of household collections beginning in 2022.

*“There are many solutions in dealing with food waste, with advantages and disadvantages to each,”* says Andrew. He wants to see any food that can go to people being picked up by food rescues, but wants to provide a solution for bulk, surplus food product that isn't fit for human consumption. *“It is very important that all solutions are supported to give business and households the choice”*.



# Case Studies

LOVE FOOD  
HATE WASTE



Love Food Hate Waste New Zealand (LFHW) is a prevention-based campaign that tackles household waste. The main objective of the original three year LFHW campaign was to quantify how much food New Zealanders throw away each year – both in terms of volume and cost – and then use this data to motivate and educate Kiwis on how they could waste less food. Central Government invested in the campaign for three years, while Local Government still supports it.

The LFHW campaign is an initiative of the Waste Management Institute New Zealand (WasteMINZ). WasteMINZ is the largest representative body of the waste, resource recovery and contaminated land sectors in New Zealand. Previous NZ Champion of 12.3 Jenny Marshall ran the campaign, alongside a full-time Communications Coordinator (until 2018).

In addition to raising awareness of the issue of food waste, LFHW uses a solutions-based approach to give people the knowledge and tools they need to reduce the amount of food they waste, with a specific focus on families with children aged under 15 and people who live in large households. An online hub<sup>145</sup> was created to highlight the issue of food waste, with helpful tips and recipes for the most commonly wasted foods in NZ, while messages were also shared through social media (45,000 likes).<sup>146</sup> Key influencers and thought leaders were identified and partnerships created to ensure multichannel messaging. At a regional level, the 60 participating councils have delivered more than 366 events to engage with their community in a hands-on way.

The campaign has proven to be successful, with 27% reduction in household food waste by those who had heard of the campaign. However, the campaign currently only has 0.1 FTE behind it and needs to regain central government support for nationwide impact. We recommend the government reinvests in spreading the LFHW message.



<sup>145</sup> [Love Food Hate Waste](#)

<sup>146</sup> Love Food Hate Waste [Facebook Page](#)

# Conclusion

Summary of Solutions



# Production



## GOVERNMENT

Urgently set a food waste reduction **target** in line with SDG 12.3 or explore a **ban of food waste to landfill**

Progress existing commitment to **agreed definitions** and data collection through a **food loss and waste baseline**

Support NZ Food Waste Champions to implement a **Voluntary Commitment** programme which will drive food waste reduction across business signatories

Consider introducing **statutory codes of contractual conduct** to ensure fair trading

Support alternative markets and **donation avenues** e.g. New Zealand Food Network

**Invest in innovation** to support initiatives that reduce food waste in production

## PRODUCERS

**Measure** food loss and waste using international guidance and as part of a Voluntary Commitment

**Improve harvesting practices** and managing pests and diseases

Keep up to date with **innovation and technology** e.g. artificial intelligence

Identify alternative markets or make **donations** e.g. New Zealand Food Network

## COMMUNITY

Undertake **gleaning missions** to collect crops from fields which may be left unharvested

**Key:** Grey = a solution across the whole food supply chain

# Processing



## GOVERNMENT

Urgently set a food waste reduction **target** in line with SDG 12.3 or explore a **ban of food waste to landfill**

Progress existing commitment to agreed definitions + data collection through a **food loss and waste baseline**.

Prioritise food waste reduction in research and innovation institutions through **targeted investment** e.g. University of Otago Food Waste Research Theme

Provide **guidance** to businesses on how to utilise non-optimum food product as part of product information forms (PIFs)

## GOVERNMENT | MANUFACTURERS

Encourage **collaboration** and a Voluntary Commitment within the processing sector to identify waste streams and opportunities e.g. Sustainable is Attainable

**Research** effective packaging and labelling practices that complement food waste reduction e.g. resealable packaging

Explore the potential of **up-cycled products/ by-product** valorisation e.g. Bioresource Processing Alliance and as part of a Voluntary Commitment

## MANUFACTURERS

Look into measurement and **process optimisation** e.g. hiring sustainability consultant

Adopt **good software** and technologies e.g. enterprise resource planning

**Know your customer** and meet their needs e.g. portion size and sharing sustainability stories

# Retail



## GOVERNMENT | RETAILERS

Urgently set a food waste reduction **target** in line with SDG 12.3 or explore a **ban of food waste to landfill**

Progress existing commitment to agreed definitions and data collection through a **food loss and waste baseline**

Support a **Voluntary Commitment** programme: with a Target, Measure, Act approach to reducing food waste

Increase the capacity of the **food rescue sector** e.g. funding and support to Aotearoa Food Rescue Alliance and members

## RETAILERS

Prioritise reducing food waste as a **business objective**

Explore particular **product solutions** e.g. non-compostable meat going to EcoGas

**Train and educate staff** e.g. through videos and meeting food rescue organisations

Explore **local models** and develop **closer relationships with farmers**

**Relax buyer specifications**

Invest in **new technology** to reduce excess inventory and handling

## RETAILERS | CONSUMERS

**Influence consumers** through consumer awareness techniques and campaigns

# Hospitality



## FOR GOVERNMENT | HOSPITALITY

Start **measuring** hospitality food waste to capture data insights, supported by Government's commitment to a baseline and interest in a Voluntary Commitment.

Support a hospitality food waste awareness campaign e.g. Guardians of the Grub

Support the development of hospitality **business studies** to use as inspiration

Explore a **waste-free ranking** that incorporates food waste reduction

## HOSPITALITY

**Train and educate staff**

Use waste-friendly service models e.g. set menus

Celebrate **available and local ingredients** e.g. specials based on leftovers

## HOSPITALITY | CONSUMERS

**Reduce plate waste** through portion and plate size techniques

Offer "doggy bag" services e.g. Reusabowl

Visit **waste-free** hospitality options e.g. Everybody Eats

# Household



## FOR GOVERNMENT

Urgently set a food waste reduction **target** in line with SDG 12.3 or explore a **ban of food waste to landfill**

**Support national consumer awareness campaigns** on prevention e.g. re-investing in Love Food Hate Waste

Work towards better **infrastructure** for diversion from landfill e.g. composting facilities

Implement effective **household organics collections** across New Zealand

## FOR BUSINESS

Get involved in **consumer awareness campaigns** e.g. Love Food Hate Waste

## FOR CONSUMERS

Adopt individual **behaviour changes** that reduce food waste e.g. freezing food, loving leftovers and using a list

Use **food sharing apps**/other technologies e.g. Foodprint

Understand difference before **“best before”** and **“use by”**

**Compost** at home or use community composting services e.g. Kaicycle

### **Thank you to all of our NZ Champions of 12.3:**

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**AGMARDT**

FUTURE SHAPERS

food waste  
innovation  
Food Waste Technical & Social Innovations Research Group



NZ FOOD WASTE  
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