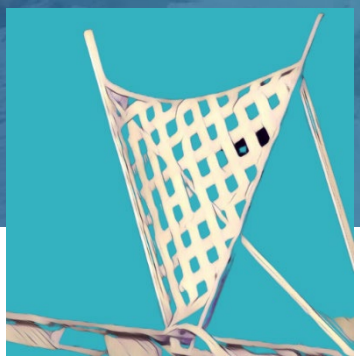

Pūhau ana te rā: Tailwinds

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Title: Food waste initiatives in the tertiary sector in Aotearoa New Zealand: the challenge of meeting SDG 12.3

Authors: Briar Mills, Dr Ray O'Brien, Prof. Miranda Mirosa, Prof. Sheila Skeaff

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Abstract

Food waste is a global issue; 30 to 40% of all food is wasted. Despite a growing body of research, information on food waste in the tertiary education sector is lacking. The variety and size of foodservice operations at tertiary institutes provides an opportunity to address food waste and work towards Sustainable Development Goal Target 12.3. We investigated food waste initiatives at 13 tertiary institutes in Aotearoa and identified challenges to further initiative implementation. Semi-structured interviews were conducted with staff working in sustainability at each institute. The most common initiatives included worm farms (n=11), solutions for leftover foods (n=11), and composting (n=9). Challenges to the initiatives included: the Covid-19 pandemic; contamination of organic food waste destined for composting; attitudes of individuals and institutes; and funding and resources. Although a range of initiatives are in place, these approaches are near the bottom of the waste hierarchy. New initiatives should be developed to reduce the volume of excess food, focusing on prevention and avoidance rather than recycling and recovery. Tertiary institutes in Aotearoa should also adopt the "Target, Measure, Act" approach to tackle food waste, through setting formal goals, regularly measuring food waste, and acting by implementing a wide variety of initiatives.

Keywords: food waste; tertiary institute; Sustainable Development Goals; higher education; waste prevention; composting; food donation; sustainable consumption

1. Introduction

Food waste can be defined as any food, both edible and inedible, that is "removed from the food supply chain to be recovered or disposed" (EU FUSIONS, 2016). Food waste is a growing issue worldwide, as currently around 30 to 40% of all food produced is wasted (Gustavsson et al., 2011; World Wildlife Fund Food Practice, 2021). The adverse social and environmental consequences of food waste cannot be ignored (Schanes, Dobernig, & Gözet, 2018). The Sustainable Development Goals (SDGs) were developed by the United Nations to address health, education, inequality and economic growth (United Nations Department of Economic and Social Affairs). SDG 12 aims for responsible consumption and production, the third target of this goal (SDG 12.3) hopes to "halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses" by 2030 (United Nations Department of Economic and Social Affairs, 2021).

Tertiary institutes in Aotearoa New Zealand are committed to becoming more sustainable, with the vice chancellors from all eight universities resolving to "show leadership in the implementation of the Sustainable Development Goals at a national level" (Universities New Zealand, 2019). Aotearoa has three categories of public tertiary institution: universities, polytechnics, which offer vocational and technical education, and wānanga, which incorporate traditional Māori practices (tikanga) into learning (Ministry of Education, 2021). Because of the large size of tertiary institutes, with over 390,000 students in Aotearoa (Education Counts, 2022), tackling campus food waste will help tertiary institutes meet carbon emission and landfill diversion targets, and achieve SDG 12.3 (Ahmed et al., 2018). Tertiary institutes have a number of unique features. For example, they typically have multiple types of foodservice operations such as hostels, cafes, food trucks, and frequent catered events. Furthermore, tertiary institutes have large numbers of staff and students working and living on or near campus. Thus, the nature of tertiary institutes provides multiple opportunities for different food waste prevention and reduction initiatives.

Measuring food waste in tertiary education is gaining interest around the world. Leal Filho et al. (2021) surveyed 52 higher education institutes from 24 countries, including Aotearoa, investigating food waste initiatives in place and challenges preventing long-term change. The key findings of this study were that most universities did not regularly measure food waste, and that the use of external catering providers limited waste prevention on campus. Musicus

et al. (2022) focused on foodservice at universities in the United States and surveyed 57 foodservice staff. Compared to the global study by Leal Filho et al. (2021), Musicus et al. (2022) found a considerably greater number of institutes measured food waste and stated that initiatives such as forecasting and reusing leftovers were common prevention strategies.

A best practice approach in food waste reduction is "Target, Measure, Act" developed by the United Nations Environment Programme alongside Champions 12.3 (Food and Agriculture Organisation of the United Nations, 2020). This involves setting a target for food waste reduction, followed by obtaining a baseline measurement so progress towards the target can be tracked. The final step is acting, by implementing initiatives to prevent and reduce food waste, alongside regular measurement to monitor progress. This method has been shown to successfully reduce food waste in the United Kingdom, which has reduced food waste per capita by 27% over 11 years (Food and Agriculture Organisation of the United Nations, 2020).

The aim of this study was to obtain information about current food waste initiatives at tertiary education providers (universities, polytechnics and wānanga) in Aotearoa, including measurements and actions, and to identify challenges faced by tertiary institutes in achieving SDG 12.3. While there is literature on food waste reduction strategies in tertiary institutes, and literature that addresses food waste reduction in Aotearoa, there is no in-depth assessment of food waste reduction at tertiary institutions in Aotearoa. This research aims to address this omission. Broadly speaking, tertiary institutes tend to have three dimensions; teaching, research and operations (McMillin & Dyball, 2009). While institutes around Aotearoa are undertaking food waste work in all three dimensions, this study focused on efforts in operations.

2. Materials and methods

This was a qualitative study, conducted in 2022, designed to gather insights into food waste initiatives at tertiary institutes across Aotearoa. There are 27 tertiary institutes, including eight universities, 16 polytechnics and three wānanga. This study was approved by the University of Otago Ethics Committee (Reference number D22/071).

An email outlining the study was sent to staff who worked at tertiary institutes and had an interest in sustainability in tertiary institutes, for example, members of Universities New Zealand's Sustainable Development Goals Expert Working Group (EWG). If there was no known contact person for a tertiary institute, the email was sent to the general institutional

website. Snowball sampling was also used. Interested participants were emailed the information sheet and consent form and a time was organised for the interview. Table 1 outlines participants and their position within their tertiary institute.

Table 1: Participants and their position within their institution

Institute	**Participant number**	**Position**
Polytechnic 1	1	Sustainability-related professional staff
Polytechnic 2	2	Sustainability-related professional staff
	3	Other staff (with interest in food waste)
Polytechnic 3	4	Other staff (with interest in food waste)
Polytechnic 4	5	Other staff (with interest in food waste)
	6	Sustainability-related professional staff
Wānanga 1	7	Senior leadership
University 1	8	Sustainability-related professional staff
University 2	9	Other staff (with interest in food waste)
	10	Sustainability-related professional staff
University 3	11	Sustainability-related professional staff
University 4	12	Sustainability-related professional staff
University 5	13	Sustainability-related professional staff
University 6	14	Sustainability-related professional staff
University 7	15	Senior leadership
University 8	16	Sustainability-related professional staff

Interviews were held on Zoom and had a semi-structured format that followed an interview guide developed for the project (see supplementary material). Questions were asked about current food waste initiatives at the institute and facilitators and barriers to initiative implementation. The interviews aimed to be 30 to 60 minutes in duration. With the permission of participants, notes were taken and the interviews were recorded. Interviews were transcribed non-verbatim into a Word document, and after transcription, the participant(s) were asked to check the transcript for accuracy, with changes made if requested. Thematic analysis was used to identify key themes from the interviews. Common themes were categorised as challenges for initiative implementation. The qualitative nature

of the research, and use of semi-structured interviews, allowed for greater development of ideas than other research methods seen in the literature, such as close-ended surveys.

3. Results

Three wānanga, eight universities, and 15 of the 16 polytechnics were contacted to take part in the study; one polytechnic was a distance and online learning provider so did not have a physical campus. There were positive responses from 13 institutes. The response rate for universities was 100%, for wānanga was 33% and for polytechnics was 27%. The participants' roles in the tertiary institute varied, for example, participants ranged from the Assistant Vice Chancellor of Sustainability, to a member of a sustainability group, chef tutor, and waste minimisation specialist. While most interviews were conducted one-to-one, three had two institutional representatives present. The interview length ranged from 18 to 65 minutes.

Table 2 summarises the initiatives at the institutes. Using the best practice approach of "Target, Measure, Act," Table 2 was designed to indicate which institutes had formal targets, food waste measurement strategies, and operating initiatives in place. Sub-categories were determined from common initiatives raised in the interviews.

	Target	**Measure**	**Act**			
Institute	Formalised FW reduction targets in place	Measurement of FW	Compost	Worm farms	Solutions for leftovers	Other initiatives
Polytechnic 1						
Polytechnic 2						
Polytechnic 3						
Polytechnic 4						
Wānanga 1						
University 1						
University 2						

University 3						
University 4						
University 5						
University 6						
University 7						
University 8						

Table 2: Snapshot of food waste initiatives at tertiary institutes in Aotearoa.

	Initiative was taking place
	Initiative was either attempted and unsuccessful, or planned but not operational
	Initiative was not occurring.

Institutional targets around food waste had the fewest green boxes, with only 38% (n=5) of the 13 institutes reporting formal goals. Just over half (54%) of institutes had consistently measured food waste, with an additional 38% having less frequent measurements. All institutes included in this study had at least two initiatives in place aimed at reducing food waste, with worm farms being the most common (85%).

Table 3 provides more detail on the initiatives undertaken, which varied widely across institutes. For example, some are targets that are official, institute-wide goals, whereas other initiatives are less formal and championed by individual staff members. For more detail about the initiatives at each institute, see the Supplementary Table.

Table 3: Insights into food waste initiatives at tertiary institutes in Aotearoa.

		Institutes (%) [a, b]
Target	**Targets in place**	**11 (85)**
	Reduce waste to landfill	4 (31)
	By 50%	3 (23)

	By 80%	1 (8)
	Reduce food waste by 75%	1 (8)
	Net zero carbon by 2030	3 (23)
	Carbon neutral by 2025	1 (8)
	Waste plan but non-specific	1 (8)
	Events to be zero waste	1 (8)
	Not in place currently	2 (15)
Measure	**Measurement of FW**	**12 (92)**
	Estimates from waste management company	5 (38)
	Know estimates	2 (15)
	Sporadic	2 (15)
	General waste, but not FW specifically	1 (8)
	Annual audits	1 (8)
	Reporting from property services	1 (8)
	Not in place currently	1 (8)
Act	**Composting**	**9 (69)**
	Collected by commercial company	5 (38)
	Organic waste hub	2 (15)
	Flat composting scheme	1 (8)
	A few small scale	3 (23)
	Commercial composter	2 (15)
	Not in place currently	4 (31)
	Worm farms	**11 (85)**
	Small scale	10 (77)

	Large worm farm operation	1 (8)
	Not in place currently	2 (15)
Solutions for leftovers		**11 (85)**
	Sold at café	3 (23)
	To staff room	3 (23)
	To local food rescue	4 (31)
	To students	6 (46)
	To local marae/community	1 (8)
	Working with Foodprint App	1 (8)
	Not in place currently	2 (15)
Other initiatives		**11 (85)**
	Lean purchasing	1 (8)
	Composting workshops	1 (8)
	Pig buckets	7 (54)
	Working on kitchen measurement tool	1 (8)
	Communication efforts	2 (15)
	Trayless dining	1 (8)
	Smaller plates	1 (8)
	Green events guide	2 (15)
	Not in place currently	2 (15)

[a] Some institutes have been counted more than once in some categories, as they have more than one initiative (e.g., they receive waste measurements from contractors and also conduct annual audits).

[b] A total of 13 institutes.

Pig buckets made a frequent appearance (54%) in the 'Other initiatives' section. The use of pig buckets was associated with institutes that had teaching kitchens, with three universities, the wānanga and three of the four participating polytechnics stating that they used pig buckets.

Another common practice, reported by 46% of institutes in the 'Solutions for leftovers' section, was the distribution of leftover food from catered events to students, often through the students' associations. Donation to students is a unique option possible for tertiary institutes, as many hospitality businesses would not have such a direct relationship with the community allowing for easy and minimal fuss donation.

Thematic analysis identified a number of key themes preventing institutes from meeting SDG 12.3. Challenges to food waste initiatives included the Covid-19 pandemic (46% of institutes), contamination of organics collections (62%), funding and resourcing (69%), culture (15%), and the attitudes of individuals and institutes (46%).

The Covid-19 pandemic

The ongoing Covid-19 pandemic was a challenge for almost half the institutes, hindering the implementation of a range of planned food waste initiatives. One institute had been in discussion with Foodprint, an app from Aotearoa that advertises discounted food at the end of the day, however, the Covid-19 pandemic slowed the implementation with the participant stating that:

> Everything's just gone into a bit of a hole because of the whole Covid thing. (Participant 12)

The pandemic also delayed two institutes from carrying out waste audits, an important part of the "Target, Measure, Act" approach; one audit was delayed by six months, while the other has yet to take place. A participant said,

> We have intermittently done audits and projects and gathered some data, but… every time we try to do it Covid gets in the way. (Participant 14)

The Covid-19 pandemic has had a significant impact on global supply chains (Fortune, 2020), and another challenge was supply chain issues. One of the institutes had delayed implementation of worm bins, because of a delay with the steel needed for the structures.

Contamination of organic waste

Many institutes used composting as a method to dispose of food waste. Non-compostable items, such as plastic packaging, were frequently found in the organics collection bins, contaminating the compost. This was due, in part, to a lack of awareness and knowledge from students and staff about the process of breaking down organic waste. For example, new students often had to develop new habits when separating their food-related waste. One participant said,

> The contamination rate is horrendously high, and so although the infrastructure is there, the cultural engagement with it is not. (Participant 5)

while another said,

> I think people's lack of education and knowledge is a fundamental problem that we have to address. (Participant 2)

Institutes spent a lot of time and effort on communications, stating

> For us, the focus has been a lot about just getting to the point where people understand what bin to put things in. (Participant 13)

and

> I think the thing is the contamination… and because we've got a changing cohort of students every year, the comms piece is really important. (Participant 8)

To try and solve the problem of contamination, one participant suggested that changing the waste contract and using a company who employs people to sort the waste (i.e., when there are organics in the general rubbish they will be removed, and vice versa) could result in a much-reduced quantity of contaminated compost.

Funding and resourcing

A lack of funding and resourcing was another challenge frequently mentioned. Once new initiatives were in place, there was often a lack of staff needed to assist with the day-to-day running. One participant said

> [Onsite composting] sounds like it makes so much sense but the grounds department who are responsible for taking care of the grounds actually don't have very many staff… it's quite a large amount of compost and we couldn't really absorb it unless we had a lot more staff to work on it. (Participant 13)

For example, a lack of resourcing slowed down the implementation of an improved waste contract for one institute; cleaning staff had to change their routine in order to collect waste, including food waste, from different bins in a few locations rather than one bin in each office. The participant said,

> It took a really long time to introduce… it wasn't particularly well resourced. (Participant 13)

Cultural challenges

An interesting point raised in two interviews was the cultural challenges around food provision as a sign of hospitality. While in some cultures, it is polite to completely finish a meal, in others it is respectful to leave a small amount of food on the plate, resulting in plate waste. University foodservice, as the host, want to appear generous, so may over cater, resulting in surplus food and possible waste. When discussing this, one participant said

> In some cultures, it's deemed rude to like clean the plate, so that it's good manners to always have something left over… So even reducing portion size would not help with that, because they'll always leave something. (Participant 13)

Sensitivity to different cultural practices is important, though in some instances it may mean there will always be plate waste. Different concepts around hospitality need to be considered, particularly as tertiary institutes are so multicultural, with a participant saying,

> How we measure hospitality, it's quite closely linked to having probably more than what you can eat... I wouldn't expect, you know, my daughter [at the hall of residence] to be up at the counter and slim pickings left. (Participant 14)

Attitudes

The attitudes of both individuals and institutes was a recurring theme as a challenge. When staff and students lacked motivation, initiatives often failed. One participant said

> If you don't have all the tutors on board and all the students on board, you'd have end up sorting through all the food waste to make sure there's nothing that worms didn't like or would kill them… (Participant 1)

later adding

> It depends on who the sustainability person is, or which group of people are involved, that want to be proactive, and you know maintaining it. (Participant 1)

A participant also stated,

> It will either happen because of people, or it won't happen because of people. (Participant 12)

As tertiary institutes tend to have large numbers of administrative staff and are often of a hierarchical nature, having an institutional commitment to sustainability including support from key senior staff members was important for success, and progress could be challenging if there was not such a commitment. A participant said,

> It's that combination of having that strategic direction and also the new VC [Vice Chancellor] really championing it really helps in making it more real and achievable… you need both parts of it really to make it forward. (Participant 8)

A different participant echoed this saying

> [It] makes my job [sustainability officer] so much easier, if, if you have the backing of the Vice Chancellor. (Participant 10)

One participant discussed why institutional attitudes, as well as those of individuals, were important:

> If it's just a tutor or a staff member doing it out of their desire to do it, you don't have a structure in place. That means that when that changes it's okay because someone in facilities will pick it up and do it. So facilities are always understandably concerned whenever we suggest something that we would like to do, they just see it as resourcing and money and the red flags go up. So successful systems like that fundamentally I think need to actually come out of the structure of the business, and the business needs to see it as part of their business model, and then it will fund it, and then you have a, you know, a more consistent chance of actually making that work. (Participant 2)

Discussion

This is the first study, to our knowledge, to focus on food waste initiatives in tertiary institutes in Aotearoa. Semi-structured interviews allowed us to capture the variety of initiatives currently in place, and to identify key challenges. Kaur et al. (2021) published a systematic review of the literature on food waste at educational institutes, including quantitative assessment, drivers of food waste, food diversion and food waste disposal processes. A further two studies have reported on different initiatives in place at a wide range of institutes, both of which used an online survey. Our study expands on these studies by using interviews, rather than surveys, which can provide greater insights on food waste in tertiary education. In contrast to a survey, interviews generate deeper insight into the challenges faced when implementing food waste initiatives, provide an opportunity during the interview for clarification when needed, and have the flexibility to better understand the reasoning of participants.

Our results were similar to those reported by Musicus et al. (2022) but differed from those found by Leal Filho et al. (2021). While Leal Filho et al. (2021) found 40% of institutes measured food waste, both this study and Musicus et al. (2022) found 77% of institutes

measured food waste. Similarly, this study and Musicus et al. (2022) found 85% and 84% of institutes, respectively, donated leftovers to charitable organisations (such as food banks and students' associations), compared to 31% in Leal Filho et al. (2021)'s study. These differences may be due to Leal Filho et al. (2021)'s more diverse sample. Our study looked solely at institutes in Aotearoa, and Musicus et al. (2022) only in the United States, while Leal Filho et al. (2021) included institutes from 24 countries across six continents.

While some results may have differed between the studies, barriers and facilitators to food waste initiatives appeared to be similar. Similar to our study, Leal Filho et al. (2021) found a lack of interest from staff and from students was a challenge to preventing food waste, as well as the lack of funding for food waste initiatives. Musicus et al. (2022) reported that staffing was a barrier to both leftover donation and composting. The similarities between our study and other published data highlight how important it is for tertiary institutes to prioritise food waste reduction in their sustainability policies, to ensure appropriate resources are allocated. The systematic review of Kaur et al. (2021) noted that barriers to preventing food waste were often related to hospitality staff working in the kitchens. However, the design of our study did not include staff working in foodservice.

Limitations

This study had a number of limitations. While it reports some of the work around food waste in place at tertiary institutes in Aotearoa, it is important to acknowledge that it is focused on operations; most participants worked in operational roles, with input from staff conducting research or teaching not sought. There is considerable progress being made in these areas, such as the Food Waste Innovation Research theme at the University of Otago. Although there was good participation from the universities, response rates were much lower from polytechnics and wānanga. Universities have more students than polytechnics and wānanga combined (Education Counts, 2022), and tend to have a dedicated sustainability team or office. For 10 of the polytechnics and two of the wānanga, the recruitment email was sent to generic institute addresses. On the other hand, all eight universities had representatives on the expert working group who were interviewed.

Strengths

The study also had multiple strengths. The participants had a wide range of roles, backgrounds, and experience, including those in administrative positions and those responsible for daily operations, providing insight into the initiatives. The use of semi-structured interviews resulted in a greater depth of information and understanding of the initiatives than would have been generated with a closed-

ended survey. Finally, the results were presented using the best practice "Target, Measure, Act" approach.

4. Conclusions and recommendations

This study identified a range of initiatives currently in place at tertiary institutes in Aotearoa that aimed to reduce food waste. Although worm farms, composting, and donation of leftovers do prevent food waste from going to landfill, these approaches are near the bottom of the food waste hierarchy (Papargyropoulou et al., 2014). New initiatives need to be developed to reduce the volume of excess food and focus on prevention and avoidance rather than recycling and recovery. Tertiary institutes could also adopt food waste initiatives from other industries, such as hospitality.

It is recommended that tertiary institutes across Aotearoa formally adopt the "Target, Measure, Act" approach to reduce food waste in line with SDG Target 12.3 and international best practice. While some institutes in this study have formal institutional goals targeting general waste to landfill, it is strongly encouraged that these are adapted to include a focus on food waste and are set at institutes currently lacking targets. All tertiary institutes in Aotearoa need to set targets, which can then be included in budgets and institutional reporting, raising greater awareness about food waste. Next, regular measurement of food waste at an institutional level must be a priority. While a number of institutes are able to obtain food waste data from their waste management contractors, it is highly recommended that regular in-house waste audits are carried out in addition. Such information will help tertiary institutes identify food waste "hot spots" and prioritise efforts in these areas. Finally, more action is needed to meet SDG Target 12.3 to halve food waste by 2030. Engaging students and student groups is encouraged, as young people are often enthusiastic and motivated to make change. A report was generated from this research that was shared with participants, in the hopes of contributing to a conversation about food waste between tertiary institutes. Sharing knowledge, successes, setbacks, and resources is important to facilitate change in this sector. Collaboration is needed to help tertiary institutes achieve SDG 12.3. Progress has been made, but more progress is required.

5. Acknowledgements

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6. Disclosure statement

The authors have nothing to disclose.

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Supplementary material for *Food waste initiatives in the tertiary sector in New Zealand: The challenge of reaching SDG 12.3*

Interview guide:

Hello, nice to meet you, I'm. Just before we get started, is it okay with you if I record this interview and take notes?

As you know, the aim of the research is to find out about food waste initiatives happening at tertiary institutes around Aotearoa. I'm going to ask a few questions about your institute and your role, and then I'd like to discuss initiatives already in place. Finally, we'll talk about positive and negative factors impacting food waste prevention and reduction in the tertiary sector. As stated on the information sheet and the consent form, if you'd like to stop at any time, you're welcome to. You can also choose to not answer any questions if they make you feel uncomfortable.

So to start with, what is your role at [the organisation], can you tell me a little bit about what that entails?

What can you tell me about sustainability at the [university/polytechnic]?

- To what extent is sustainability central to the institute's strategy?
- Is sustainability centralised, or each campus/area has its own way of doing things/person in charge of sustainability etc.?

Do you know if the university/polytechnic collects any data on food waste? Why or why not?

Are there any initiatives already in place on campus aimed at reducing food waste or minimising food waste to landfill? If no, prompt with findings from website (green bins/compost etc.), or jump to pg. 2

Tell me about some of the food waste initiatives you have successfully run.

Prompts:

- When was it established?
- Who was involved in the beginning (individuals and organisations)?
- What were the goals of the initiative (financial, environmental, social, consumer facing)? Did these change at all?
- What were the resources involved in setting it up (time, expertise, funding)?
- What were the risks and costs? How did you balance these against the benefits?
- Did the implementation happen as you anticipated? How and why was it different?
- How do you think it was received by students and staff?

So it sounds like it has been in place for a while now, and people have probably got the hang of it.

- What would you say is successful about the initiative? Why has this been successful? How do you measure this success?
- Has it turned out differently to plans? If so, how and why? Do you think these differences have been positive or negative, or a bit of both?
- Is there anything that has been unsuccessful about it? Why has this aspect been unsuccessful?
- What were the main factors involved in successfully establishing the initiative (time, clear goals, expertise, funding)?
- What are the main factors involved in maintaining the initiative (management, collaborative relationships, funding, other resources)?
- Do you have any thoughts as to how it could be improved?
- Are there any other people who have been heavily involved in the initiative who you may not have mentioned, or who have come aboard since implementation? Like upkeep volunteers or something?

What do you think would help other organisations implement or use a similar initiative or resource?

Could government policy play a role in assisting the initiative? If so, how?

It sounds like you've already got this great initiative in place, so my next questions are more broadly about food waste at the university/polytechnic.

What are the key facilitators to minimising food waste at the [institution]?

E.g.

- Students and staff are passionate about is and want to make changes
- The council has a green bin programme already

What have you found to be barriers to minimising food waste at the institute?

E.g.

- Don't want to give away food as don't want sickness
- Don't have the funding or dedicated staff for implementing changes
- Don't have the space for compost heaps etc.

Is there anything else you would like to talk about, or that you think I should know about your food waste initiatives or food waste at your university/polytechnic?

I will send you my notes after the interview if you would like to check them for accuracy and in case you would like to add or remember something else later. Would you like a copy of the final report at the conclusion of the project? There's also the possibility of reports being published showcasing initiatives and discussing barriers, is it okay if your institute is named?

Thank you for your time.

Supplementary table:

	Target	Measure	Act			
Institute	Formalised FW reduction targets in place	Measurement of FW	Compost	Worm farms	Solutions for leftovers	Other initiatives
Polytechnic 1	Net zero carbon by 2030, and other carbon goals, not specifically FW	No actual measurements, though do know approximately how much		Run with life skills students, running for 10 years	Discounted rate in café or to staff	Pig bucket in teaching kitchens for all inedible food scraps
Polytechnic 2	Reduce waste to landfill by 50%, with city council	Waste management company provides the data, have also done their own audits in the past	Tried but unsuccessful	At a couple of the regional campuses		Pig bucket at the main café
Polytechnic 3		No actual measurements, though do know approximately how much	Previously have but no longer functioning		Sold at campus café and pop-up, given away with students' association	Pig bucket for kitchen scraps (including teaching kitchens), relationship with local organisation to turn excess food into usable products
Polytechnic 4	Reduce waste to landfill by 80% from 2017	Annual campus waste audits and snapshot measurements of what comes into worm farm operation	Flat composting scheme and large-scale compost systems in place	Large worm farm operation	Work with KiwiHarvest and students' association	

Wānanga 1	Part of government's carbon neutral 2025 program but not explicit targets yet				To staff, students and community	Pig buckets at catered meals
University 1	Reduce waste to landfill by 50%	Get estimates through waste management company and AUT staff from compost hub	Commercial company collects compost at City campus for offsite composting, on campus compost hub at North campus	Eight worm farms at City campus, with waste from School of Hospitality and Tourism teaching kitchens	Informal, goes to staff rooms. Leftovers from teaching kitchens sold at City campus outlet	Lean purchasing in teaching kitchens and Hospitality Services main kitchen. Offer free annual composting workshops for staff and students.
University 2	Reduce FW by 75% by the end of 2023	Measurements taken but not always reliable	Commercially through waste management company	Small worm farms around the campus led by staff and students		Used to have pig buckets but no longer
University 3	Net zero carbon by 2030, and other carbon goals, not specifically FW	Collect data on general waste to landfill, and a few years ago had an FW audit	Through the city council/Compass	Small scale, championed by staff	To Kaibosh on Wellington campus, ad hoc	
University 4		Waste management company provides data	Commercially through waste management company	Small number around campus, some student-led, others managed by gardens staff	Discussions with Foodprint app but delayed	Looking into kitchen measurement tools but not in place yet
University 5	Mentioned a waste plan but not specific goals	Waste management company provides the data, have also done their own audits	Commercial collection and in community garden	In community garden, used for lunch and garden scraps	Pushed towards students	Communication on IG around contamination, food from café kitchens to pigs

University 6	Reduce waste to landfill by 50% by 2025	Intermittent measurements, not routine	Commercial composter but not going yet, also one students' association has a community garden with composting	20 worm farms around the campus for staff room FW	To student study centre and KiwiHarvest	Lots of initiatives in halls – reducing plate size, removing trays, promoting having seconds
University 7	Net zero carbon by 2030, and other carbon goals, not specifically FW	Part of annual reporting through property services team	Commercial composting machine, does need some refinement	At Tauranga campus, established with grant from council	Relationship with Kaivolution food rescue and Good Neighbour	Relationship with local pig farmers for scraps from halls, green events guide
University 8	Events to be zero waste, general goal rather than formal target	Waste management company provides the data	One café has FW collected by a compost company	Started just before lockdown	To students' association	Events guide for catering, small amounts of behaviour change for students in halls