

A Menu for Change

Exploring Food Waste and the Food Recovery Hierarchy Through Industry Insights

January 12th, 2024

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The Problem With Food Waste

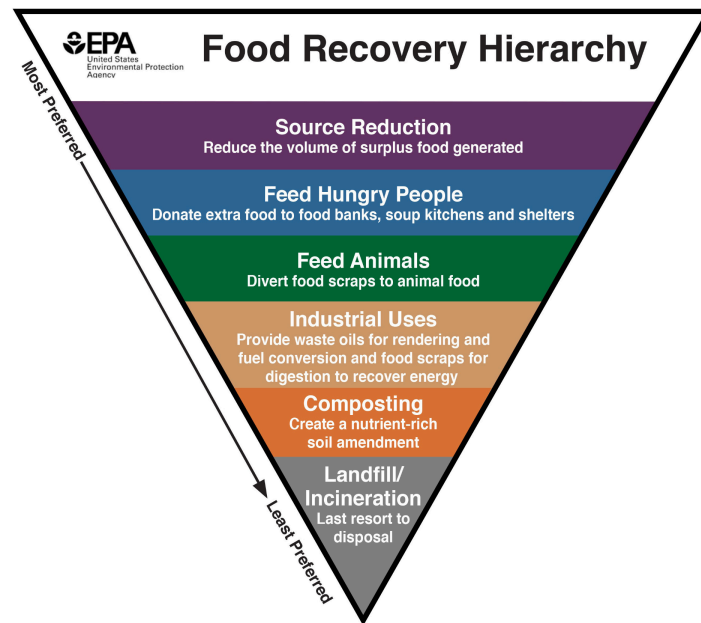
In the face of extreme environmental instability and widespread, global food insecurity, food waste continues to be one of the most significant contributing factors regularly overlooked. The problem of wasted food is so rampant in our system that globally, one billion meals go uneaten daily (Gunders, 2024). The devastation of this statistic lies beyond the simple fact that this food will not be used to benefit the world and will instead contribute to climate change in a landfill setting. It also acts as an insult to all of the energy and resources that go into the growing and production of this food. At every step of the journey to get food from its inception phase to having it on your plate, the world's assets have been used. In an ideal landscape there would be zero food waste, everything that was grown and produced would be consumed or used in some cyclical way that brings about

future benefits. While this utopian ideology is not possible with the world's current system, some steps can be taken to divert unnecessary food waste from entering landfills.

As a student with a passion for food systems and the necessary advancement towards a more future-proof restaurant infrastructure, I spent the fall semester interviewing some of Ontario's top industry leaders on their food waste reduction protocols. To do this, I met with interviewees from backgrounds spanning large event venue food service to farm-to-table fine dining. Armed with a list of questions developed based on the Environmental Protection Agency's Food Recovery Hierarchy (EPA, 2016), each participant walked me through the life cycle of food in their establishment and what measures are taken to keep that food from ending up in a landfill. As we go down the inverted triangle that is the Food Recovery Hierarchy, we learn about some food waste reduction challenges currently faced by the industry, but also get a chance to be inspired by the advancements and out-of-the-box ideas contributing to the future of sustainable foodservice.

Understanding the Food Recovery Hierarchy

The Food Recovery Hierarchy was a framework developed to showcase the order of steps that should be taken to keep food out of landfills, and therefore prevent many of the negative social and environmental impacts associated with food waste. At the top of the pyramid is "**Source Reduction**", which stresses the point of limiting the amount of excess food generated whenever possible. If there is no excess food there is no chance of it being wasted, and as such the recovery process becomes irrelevant. Following this, the levels of "**Feeding Hungry People**" and "**Feeding Animals**" lean into the idea of redirection to living organisms who would need to eat regardless. This not only limits how much is wasted but also connects to the idea of source reduction by limiting the need for more to be generated to feed those demographics in the first place. The fourth level, "**Industrial Uses**" is not relevant to all areas of food waste, but can be used to make useful products from what would otherwise be discarded without a second thought. This includes processes such as cooking oils being used for energy production and food scraps being put through a biodigester to create nutrient-dense greywater, which is useful for watering crops. The final two steps of the hierarchy look at food disposal, the last resort when no other methods of diversion are feasible. "**Composting**" presents a much more desirable option when compared to "**Landfill and Incineration**" as in the composting process, a useful product is created that can benefit future crop production. Sending food to landfills is considered the last resort as it represents only waste, with no benefits created in the process.



The Food Recovery Hierarchy (EPA, 2016)

By learning from the people at the forefront of the industry and how they're practicing sustainability, it's easier to spot where changes are needed and what advice can help others reduce their food waste. As we go through the levels of the hierarchy below we start to get an understanding of what changes can be made, be it incorporating training adjustments or investing in artificial intelligence, for the average food service establishment to cut down on what goes in the trash. When we really start to dive in, we see that a systemic movement towards waste-conscious food service really isn't that far-fetched of an idea at all.

Behind the Research: Our Process

In order to really understand where the industry in Ontario currently stands on food waste reduction protocols, the research was gathered from both primary and secondary sources.

As always before jumping into the primary research side of things, it is important to go through the literature that is currently out there on this topic and see if there are any gaps to be explored. I found that while general food waste is a heavily researched topic, its diversion, particularly in relation to the Food Recovery Hierarchy, has very little information available. Specifically, the level of "Feeding Hungry People" and the policies surrounding providing employee meals and using food recovery organizations as a method of waste diversion were scarcely explored.

Understanding that this hierarchy, with an emphasis on human consumption as a form of reduction, is a viable area of research, I jumped into the interview process.

Who We Talked To

Through a combination of personal referrals and professional networks, 6 different industry participants from 5 businesses were recruited to participate in the study. Selected based on their involvement in food service operations and their experience with food waste management practices, each interviewee came from vastly different sectors of the industry. This was incredibly valuable to the study because it allowed us to consider a wide range of perspectives and scenarios with their own specific realms of relevancy.

Some interviews were done through video call and others came with the unique opportunity to not only speak with the professional but also tour the business. As the interviewer, I was incredibly grateful for the chance to not only hear about the amazing advancements of modern food waste reduction but also see how these methods are being put into action.

Asking the Big Questions to Inspire Change

Why is Cutting Down Food Waste Key to Our Future?

Before entering into the discussion of food waste reduction policies through the levels of the hierarchy, it was important to gather an understanding of each participant's perspective on food waste and sustainability. The resounding answer from all participants was yes, without a motivated interest in improving the current state of the system, there would be no change. A passion for improvement is the driving force for each of these organizations.

A recurring theme that all industry participants mentioned was the fact that food waste reduction lies not only in the realm of environmental sustainability, but is inherently integrated into the triple bottom line: environmental sustainability, social sustainability, and economic sustainability.

Socially speaking, Neil Robinson, VP of Operations with The Neighbourhood Group of Companies, touched on food waste running concurrently with food insecurity and stressed the idea that “when people are out there that don’t have enough food, food diversion is just a moral obligation more than anything else.” This looks at the ideology of not being careless with food when others, even in your own neighbourhood, are struggling to find it.



A sign in the Neighbourhood Groups Restaurant, Borealis Guelph, showcasing their “Obsessively Local” mindset

Becoming more economically sustainable and cutting down on wasted costs is a significant part of the control process used in food service establishments. Chris Zielinski, Culinary Director with Maple Leaf Sports & Entertainment (MLSE), discussed how incredible the impact can be on the bottom line if food waste is ignored “Our bottom line is affected if we don’t manage our food properly. With feeding 19,000 people you can’t guess exactly what they’re going to eat, but we can predict and use our tools to guess what people will order. It is always something that our staff and our managers have to be acutely aware of so that we aren’t being overly wasteful.” The money that is put into these items comes not only from their initial purchase value from producers but also through labour and resource use (ex. refrigeration, equipment, etc). By cutting down on this cost at the source, food service establishments can invest those funds into providing more quality ingredients and experiences for guests.

To truly grasp the extent of the impacts of food waste and why the reduction of this waste is so vital to each of the highlighted organizations, it’s necessary to look at it from all angles. It is a moral obligation rooted in a strong business sense that does nothing but strengthen the companies that invest the time and effort into developing a sustainable infrastructure.

How Can Food Waste Be Reduced at the Source?

The first level of the Food Recovery Hierarchy is source reduction. In other words, this describes the process of preventing food waste before it is even created. Examples of reducing waste

at the source include increasing yields of fruits and vegetables and menu planning to limit how much excess food will be produced.



A partnership between the Fairmont Royal York and local company, Civil Pours, increases yield by allowing the entirety of citrus from the bar to be put to use, rather than just the peels

Interviewees were approached with the question “*What protocols does your organization have in place to reduce the food waste that is produced? Can you provide specific examples?*”. The responses came in impressive variation, with some emphasizing the importance of staff training and menu planning, and others speaking on how advances in technology are providing insights into best practices for reduction.

Georgy Pyle, the Sustainability Manager at the Fairmont Royal York, spoke in depth about the latter and the hotel's recent implementation of the Orbisk system. Orbisk is a fully automated food waste monitor that uses artificial intelligence to capture a photo of and weigh any food that is added to the back-of-house compost systems. In one swift movement, the machine can tell you what was in the wasted dish, and then send that information to a computerized system, compiling all of the data. Here, operators can analyze what foods are being wasted the most, when and where this waste is happening, and provide recommendations to reduce it. Since the implementation of the program, the Orbisk system has heavily contributed to a 37.48% reduction in food waste per cover when compared to the 2023 baseline. This technological investment has thus far paid for itself exponentially in savings from food costs alone.



One of the Fairmont Royal York's many Orbisk food waste monitors

In a more traditional form of waste reduction, Neil Robinson detailed the importance of staff training, discussing how vital it is to ensure all staff are on the same page when it comes to organizational values. One major way that they follow this philosophy is by taking all staff on an annual farm visit to one of the group's major suppliers. This fosters a greater understanding and respect for the origins of the ingredients used in their restaurants, prompting staff to think critically about the food that they work with and avoid negligently wasteful behaviors.

As a whole, each participant guided me through fascinating practices that prove source reduction is an area with incredible opportunity for future development. It's inspiring to see the tools and methods that are being creatively implemented to change our perspectives on food waste generation and it makes me excited to learn what is next to come.

How Is Waste Being Directed to Feed Employees or Other Hungry Community Members?

When source reduction is not possible, the next ideal method of food waste diversion is redirection to hungry people. This can comprise a variety of different approaches, but for the

purpose of this study, the primary focus is on redirection to food-rescuing organizations and employees of the business. In both of these circumstances, excess food is being given to those who need it the most, as opposed to being pushed to a lower level of the hierarchy.

In terms of donating food to food banks and similar organizations, each establishment follows a different set of protocols based on local liability laws and arrangements. Chris Zielinski worked extensively with the City of Toronto in conjunction with the organization Second Harvest to rescue and divert meals to people facing food insecurity around Toronto. The work that was put in to adhere to liability laws and change processes to allow for food donation has helped MLSE go from donating 10,000 meals per year to 50,000. Georgy Pyle went through a similar process in her collaborations with a local organization by the name of B12Give, which uses digital on-demand pickup as a method of quick distribution to the community. This partnership resulted in the redirection of more than 3,000 kgs of surplus food between January and November 2024. Eric Robertson, Chef and Owner of Restaurant Pearl Morisette, takes on a different approach and donates excess food directly to local organizations including a women's shelter in St. Catharines and the areas Migrant Workers Alliance.



The MLSE and Second Harvest partnership in action at BMO Field in Toronto

When it comes to staff meals and the concept of employees taking home excess food produced, the protocols truly come down to the foundational values of the business and trust levels with employees. Certain organizations, such as the Fairmont Royal York, feature a large cafeteria

where staff members are entitled to a meal per shift. Similarly, Restaurant Pearl Morissette sees this concept as built into their morals and runs a daily staff meal where members of the team can sit down and have a nutritious meal together. Some other organizations don't have the facilities or framework to organize a large meal for every staff member, but instead, ensure staff are given food at some point during their shift.

Other than staff meals, some constraints prevent organizations from offering excess food to their employees, mostly based on cost, liability, and trust. In terms of cost, it is an expense to the organization every time a staff member takes a to-go container to fill with excess food. While seemingly a small charge, this adds up quickly when done repeatedly daily. Potential solutions such as staff bringing in their own containers offer a reasonable alternative, but that comes with liability considerations. Liability is a large concern for any aspect of the food service industry, but that is amplified when it comes to food going to staff when it is not being served fresh. Organizations want to keep their employees safe and any jeopardization to that causes second thoughts. The final potential consideration comes in the form of trust. When employees can take excess food home there remains the concern that some employees who are not loyal to the company will abuse this power and increase costs by over-producing to take food home. While this is not an ideal thought, it is a factor to be considered, especially when operating in establishments featuring high employee turnover.

I found that the humanistic trait of wanting to help those in need plays a large role in the motivation for this level of the Food Recovery hierarchy, and all participants felt passionately about ensuring their staff are fed and taken care of. When reasonable and safe, every interviewed industry leader expressed their devotion to ensuring as much food as possible can be eaten by people before moving its way down the hierarchy.

Can Food Waste Be Redirected to Support Local Livestock?

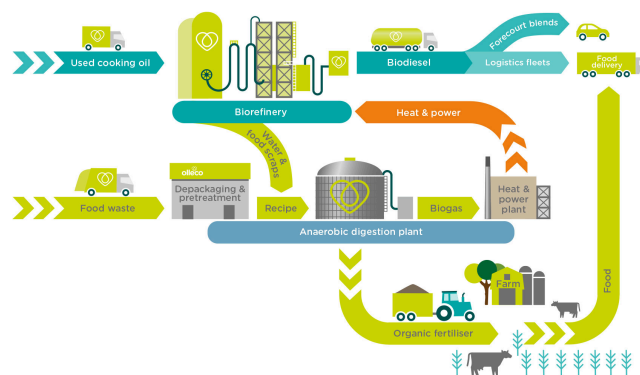
Another method of diverting waste to living creatures is by using it to feed animals, particularly livestock. In doing this, food waste is collected and, in partnership with local farmers, taken to be distributed as animal feed. When done properly this presents a waste disposal option that is both economical and sustainable, for farmers and restaurateurs alike. Unfortunately, the resounding response from those interviewed is that this infrastructure is simply not currently in place.

Certain participants, such as Neil Robinson, have tried this method of waste reduction in the past, but it was logistically unviable. The spatial constraints and liabilities involved with holding the food until the farmer's pickup made the project unsustainable in the long term. On the other hand, Eric Robertson found himself able to bypass some of the traditional concerns associated with holding the food for animals, by having the chickens on site as part of the restaurant's farm-to-table production. Though not a major part of their diet, these chickens would get scraps on occasion as a treat, acting as a win-win by helping to reallocate the waste and diversify the chicken's diet.

It was made clear to me that if the infrastructure was in place to conveniently divert waste to animals, all of these businesses would jump on the opportunity. While it is disappointing that there is currently no foundation for a system of this nature, it represents an opportunity for collaboration that can be explored in the future.

How Can Restaurant By-Products Be Repurposed For Industrial Usage?

Industrial repurposing describes the process of taking products that would be wasted and instead converting them into new products. One of the most common ways this is done is through the recovery of cooking oil. To do this, local manufacturers collect the used fats, oils, and grease from restaurants and end up producing an environmentally friendly form of biodiesel. When compared to traditional diesel, biodiesel brings a clear advantage in terms of reduced greenhouse gases, pollution upon use, and lack of toxicity (EPA, 2016). Another form of industrial repurposing comes from anaerobic digestion, a process where the restaurant's oils and greases are added to anaerobic digesters to formulate a renewable form of biogas energy.



The basic processes involved in the “Industrial Repurposing” stage of food recovery (Olleco)

Of the participants interviewed, four out of five companies do participate in processes that in some way convert used oils and fats into a form of bio-energy. To understand the scale of the oil that is picked up for energy conversion, Vijay Nair, the Director of Culinary Operations with the University of Guelph, delved into the statistics that of the estimated 35 tonnes of vegetable oil purchased annually, approximately 15 tonnes are picked up by an outside company, and converted into purposeful resources after its intended use. The prevalence of this process amongst participants emphasizes the idea that if a sustainable system is conveniently in place, food service establishments jump at the opportunity to partake, especially when it is so mutually beneficial.

Eric Robertson also touched on a new piece of equipment that the restaurant will soon be implementing - a biodigester. While definitely an investment, this biodigester will accept anything that would be considered edible, leaving out parts such as bones, and heavily churn it through a system that includes hot and cold water and oxygen, among other pieces. When the machine completes its process, what is left is a grey water solution that can either be poured down the drain, or in the case of Restaurant Pearl Morissette, used as a nutrient-dense method of watering the gardens. While they have yet to get the biodigester installed and operating, everybody is very excited about the prospects involved with the implementation of this technology.

The commonality of cooking oil repurposing and the up-and-coming wonder of an in-house biodigester prove a very exciting future on this level of the Food Recovery Hierarchy. Those in the industry should take these processes as inspiration for new concepts and innovations that develop in the realm of waste reduction.

Some Waste is Inevitable, But Why Should We Ensure It Ends Up in Compost?

In circumstances where initial waste reduction cannot be done and there is no viable way to redirect or repurpose it, composting is the most ideal option. In composting, food waste is disposed of in a way that allows contact between organisms and the waste, enabling its breakdown into a rich, organic soil. This compost is vital for the rejuvenation of soil, providing nutrients back into the earth that facilitate healthier and stronger crops for future generations.

In discussion with the industry participants, it is clear that composting is an expense most are willing to undertake to reap the benefits. For many outside of city cores, it is the responsibility of the business to finance their compost pickup, proving that devotion to sustainability is required for change to happen. This being said, evidence leads me to believe that if I were to have interviewed businesses less devoted to sustainability, or in cities where composting is not a normal process, the sentiment would be different. It takes a desire to improve for businesses to justify the added expense of composting, even when it is recognized as incredibly impactful.

One way to combat this discrepancy across the sector would be through government intervention. The current laws in Ontario for composting regarding commercial businesses are extremely lax, detailed only in the *"Food and Organic Waste Policy Statement"* (Ballard, 2018) as suggestions to boost resource recovery in the province. These guidelines lay out that any commercial producers, including restaurants and hotels, that generate more than 300 kg of food waste a week should separate organic compost. Unfortunately at the end of the day, the implementation of these policy recommendations still comes down to the discrepancy of municipal governments. Considering that the heavy majority of municipalities continue to avoid action on the topic of regulated composting for restaurants, it's evident that change will only come when

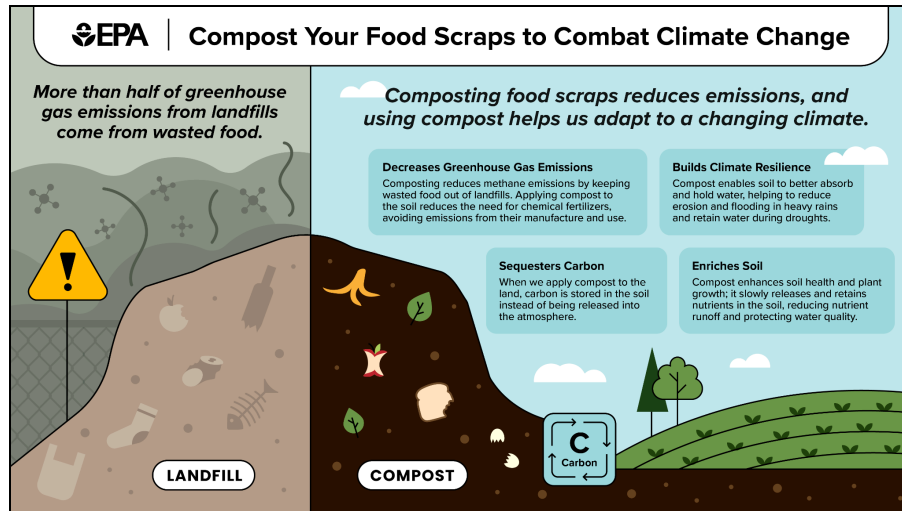
overarching provincial policy is put into action, insisting commercial businesses separate and properly dispose of their food waste.

For those that do invest in composting, a recurring factor of success in the back of house was the convenience of use. If it is difficult for those working with food to access the compost bins in a high-paced environment they are going to have to make a decision that does not always lean in favor of composting. Fortunately, save for spatial constraints, this can and has been fairly simply mitigated by putting compost bins in every convenient location. When staff see these they remember the training and the values of their organization and commit to the reduction of food waste going to landfill. If management ever notices discrepancies in this process it is simple for them to have a conversation with staff as a reminder of the kitchen procedures.

The composting level of the Food Recovery Hierarchy seems to be one that all industry leaders are on the same page with. While each establishment has to follow different guidelines and create different arrangements, the understanding of the vitality of composting is universal.

The Last Resort: What is Ending Up in Landfill?

Unfortunately, despite the efforts at each step of the hierarchy, there is still a small percentage of food waste that ends up in landfills or incineration. This could happen for a variety of reasons, including cross-contamination with non-food products and time constraints that lead to waste misplacement. Looking at all of the methods of diversion above you may ask yourself, “Why should I even care if some food ends up in a landfill when we’ve been able to stop so much already?”. The answer to that comes down to the environmental impacts associated with having food waste in landfills, and how even reduced amounts of organics decomposing in these facilities can contribute to climate change.



The contribution of landfills to the world's greenhouse gas emissions (EPA, 2016)

Though on the surface the differential between throwing something in the garbage versus the compost may seem negligible, the diagram above details how much of an impact the relatively simple adjustment can make, primarily concerning greenhouse gas emissions. When food waste is sent to landfill and it is forced to break down anaerobically (without oxygen) the decomposition produces high levels of methane, an extremely damaging greenhouse gas. While more and more methane is released into the atmosphere, climate change accelerates as methane helps to trap heat that would otherwise escape, exemplifying the “greenhouse effect” (EPA, 2016).

With this understanding of the vitality of reducing organic levels in landfills, we can examine how our interviewed businesses are taking that last step to divert waste from the trash. In talking with the participants, it became very clear to me that even though amazing progress has been made, with the ever-developing technology and systems of today there is always value in stepping back and reevaluating where your waste is going.

Georgy Pyle has taken the concept of developing technology in tow and implemented a system known as OSCAR Sort Smart Recycling Assistant outside of the staff cafeteria. When staff finish their meals and go to the sorting station, the OSCAR system will recognize the items on their plate and inform them of the proper sorting locations. Involving interactive screens has been an engaging way to actively include and educate staff on food waste protocols. Incredibly, this system has helped divert paper napkin waste from landfill into compost by a stellar 61%.



The Fairmont Royal York's OSCAR Sorting System

When looking at advancements such as OSCAR it becomes clear that one of the most important concepts when moving forward is to look at waste with an open mind. Understand that there are establishments that follow different protocols and use different tools that could have potential benefits for your organization.

Final Thoughts

Based on my series of interviews conducted with industry experts, it became evident that addressing the problems associated with food waste is a multifaceted challenge, calling for innovative solutions. While the world continues to cherish the experiences offered by going out to eat at a restaurant, the pressing issue of food waste demands the operator's attention.

The Food Recovery Hierarchy, which was used as a framework for this study, highlights the areas of food waste reduction and diversion with the most opportunities, and those presented with the most challenges. The first step in the hierarchy, Source Reduction, has experienced an influx of creative solutions to cut down on costs and limit any production in excess. This may be due in part to the fact that this is the level presenting the most economic incentive to innovation. On the other hand, Feeding Animals has seen its challenges and requires systemic evaluation to be a more widespread, viable option for the majority of restaurant operators.

The findings of my interviews also highlight that technological tools, such as the Orbisk and OSCAR Sort systems play a fascinating role in reducing food waste by providing data-driven insights and automated processes. Additionally, collaborative techniques, including partnerships with local food donation services and oil collection agencies, enable the redirection of surplus food to agencies

with the means to repurpose it. Finally, the importance of education and staff training cannot be emphasized enough. When staff are well trained on the values of their company, it is simple to ensure that their actions align with the organization's mission of food waste reduction.

As a whole, it has been inspiring to get an insider glance at some of the most innovative ideologies and methods currently used by local food service industry leaders. The advancement showcased is a beacon of light for those interested in understanding the industry's current food waste landscape, and the openings for opportunity underpinning where future growth will occur. The widespread adoption of the strategies included would pave the road towards a more sustainable food service landscape, ultimately benefiting individual businesses, the environment, and society at large.

References

Ballard, C. (2018, April 30). *Food and organic waste policy statement*. ontario.ca.

<https://www.ontario.ca/page/food-and-organic-waste-policy-statement#section-0>

Gunders, D. (2024, June). *How to turn the tables on Food Waste*. Dana Gunders: How to turn the tables on food waste | TED Talk.

https://www.ted.com/talks/dana_gunders_how_to_turn_the_tables_on_food_waste?subtitle=en&ct=t%28EMAIL_CAMPAIGN_6_29_2023_14_20_COPY_01%29&mc_cid=9258350715&mc_eid=2dd1adb9d8

Environmental Protection Agency. (2016, August 29). *Reducing the impact of wasted food by feeding the soil and composting*. EPA.

https://19january2017snapshot.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting_.html

Used cooking oil recycling for UK businesses. Olleco. (n.d.).

<https://www.olleco.co.uk/sustainability/used-cooking-oil-recycling>