

WASTE BYTES

University of Otago Food Waste Innovation Newsletter 1

 food waste
 innovation
Food Waste Technical & Social Innovations Research Group

 UPCYCLED
 FOOD LAB


REDUCING THE VOLUME AND IMPACT OF FOOD WASTE

Food Waste Innovation measures food waste, develops reduction strategies, applies innovative technology, and works to modify producer and consumer behaviour. We work collaboratively with stakeholders and supporters in the public and private sector.

Note from the Director

Associate Professor Miranda Miroso

Welcome to the first edition of our Theme's newsletter. As you are aware, food waste is a pressing national issue and tackling food waste will be a triple win for NZ: environmentally, socially, and economically. So, to help provide effective solutions to NZ's FW problems, we have established a University Research Theme which harnesses research expertise from across the Arts, Sciences and Commerce disciplines. The Theme launched in October 2020, hosting an official opening evening with a panel discussion from the NZ Champions 12.3 group, as well as a Food Waste Innovation Forum. Our research falls into three sub-themes: The first of these is focused on helping the NZ industry capitalise on the 'deriving value from waste' market and my Food Science colleague Prof Phil Bremer leads this work. Secondly, research is also needed to better understand the behavioural drivers responsible for food waste to support better decision making by government, businesses, and individuals, so the second sub-theme is 'Social Innovations', which I head up. The final sub-theme, 'Metrics and Management', is about understanding how much food is being wasted, where it is being wasted and its social, economic, and environmental impacts. This work programme is led by my colleague Prof Sheila Skeaff, Human Nutrition. Of course, given that food waste is a multifarious issue, an interdisciplinary approach has the best chance of solving it, so all subthemes work closely together, overseen by the Theme's Manager Trixie Croad. Since the launch, some amazing mahi has been done which you can read about in this newsletter's sub-theme research updates on the pages that follow.



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But there is so much more work to be done. We need to better understand the behaviour, of both producers and consumers. We must look at how we might change what we are doing to reduce food waste. All of this must be underpinned by good scientific research. We currently have an amazing network of over 30 researchers and 20 supporter organisations and would love to expand this further. If you are a prospective undergraduate or postgraduate student keen to tackle the wicked issue of waste, there are avenues for Food Waste Innovation related study as well as research opportunities available on our website so make sure to check these out. Achieving food waste reduction will require big acts by big players, as well as millions of acts by everyone from farmers to consumers. So, if your organisation is interested in becoming a Theme supporter, or you are keen to join our mailing list as an individual, please contact us. *Nga mihi nui, Miranda.*

SPOTLIGHTS

RESEARCHER SPOTLIGHT

**Dr. Dominic Agyei, Lecturer
Food Science**



What is your background before your role at the University of Otago?

I hold a BSc degree (Honours) in Food Science and Technology, as well as a PhD degree in Chemical (Bioprocess) Engineering. During my PhD, I worked on producing microbial enzymes for use in generating health-promoting peptides from milk proteins. It was then that I became

aware of the enormous quantities of unavoidable wastes and by-products generated from the processing of dairy products. Consequently, I authored a book chapter on this topic. **Available here:**

<https://www.sciencedirect.com/science/article/pii/B9781782422853000065>

What are you working on at the moment?

The work involving the production of galactooligosaccharides from whey waste is still ongoing. We are at the stage where we are ready to test the ability of the oligosaccharides to support the growth of probiotics and generate gut health-promoting compounds such as short-chain fatty acids. I am also doing some work on the generation of Vitamin D from mushroom through UV treatment. This interesting work is funded through a seed grant from the Food Waste Innovation Research Theme. I also have in-kind support from Meadow Mushrooms, the leading producer of mushrooms in New Zealand.

What interests you about food waste?

Waste is an interesting concept. Looking at it from the social/business perspective, people often look at surplus or by-products and just see waste. But from the perspectives of chemistry, I think food waste and by-products are an interesting group of raw materials. This is simply because they are rich in a diverse range of chemical compounds, most of which are known to perform one function or another in food, drugs, and cosmetics. Because of my background in bioprocess engineering, when I see food waste/ by-products, I also see a product of value – much the same way a metallurgist will see precious metals in crude ore. Admittedly, getting products of value from food wastes requires work and a good scientific background in the chemical composition of the waste product in question. Personally, it is always thrilling to design a bioprocess that is able to obtain something of value out of food wastes.

POSTGRADUATE SPOTLIGHT

**Trixie Croad, MA Candidate,
Sociology and Food Science**



What is your research topic?

I am pursuing an MA at the Centre for Sustainability, under the supervision of Assoc. Prof. Miranda Miroso and Prof. Hugh Campbell. My thesis is looking at systemic food waste in the primary production sector. My case study is the NZ Kiwifruit industry.

What brought you to the University of Otago?

I originally studied sociology at the University of Hawaii, Hilo. I became particularly interested in the sociology of the food system. Once I returned home to NZ, I moved to Dunedin to work for food rescue organisation KiwiHarvest for a year before starting my masters at the University of Otago.

What is the purpose of your research?

I think it's important to understand how waste can be systemic. My goal is to give a holistic picture of the mechanisms built into our food systems at primary production that contribute to waste. I think this is particularly pertinent in New Zealand where we produce enough food to feed 4x our population. Although my case study is on the Kiwifruit industry, I am hoping my framework can be a blueprint for understanding waste at a systemic level across other food production industries as well.

What is involved?

I have been conducting semi-structured interviews with various stakeholders in the kiwifruit industry, as well as reviewing related industry documents. I will then use a thematic analysis technique to articulate how a range of different factors such as industry governance and structure, attitudes and behaviours, as well as practical/technical mechanisms such as crop management could be working together to enact systemic waste.

SUB-THEME UPDATES

At the beginning of this year, we launched our new Upcycled Food Lab. This lab is a resource provider for industry as well as researchers interested in upcycled food. We bring together researchers at the University of Otago and industry partners to provide a range of services from research and consultancy to food product development. As an example of work in this space, Food Scientists, led by Prof Phil Bremer and our Upcycled Food Lab Coordinator Grace Clare, in collaboration with Citizen Collective, 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. As well as a great tasting, 'bread-waste-hungry' beer, we produced a homebrewers guide which will be launched soon... watch this space! In the spirit of 'no waste', Grace also used the spent grain to create a cake to celebrate NZ Champions of 12.3's first birthday.



TECHNICAL INNOVATION SUB-THEME UPDATE

Read the article - <https://foodwaste-otago.org/news/the-star-cake-and-beer-together-at-last>



SOCIAL INNOVATIONS SUB-THEME UPDATE

Earlier this year, we provided a research scholarship to second-year student Andreas Wijngaarden to work with Foodstuffs NZ and upcycled food company Citizen Collective over the summer to collect data about consumer perceptions of upcycled food items in supermarkets. Read more about the project in the Otago Connection story. We provided a second summer studentship, funded through a Waste Management grant, to Ashlee Drummy to create a resource for students in flats to help encourage them to reduce their food waste. The final product of Ashlee's project was a set of 8 weeks of meal plans, including recipes, shopping lists, and tips for storage of food and utilising leftovers. These meal plans were tested in student flats earlier this year and are now available on our Theme website as well as on the Otago University Student Association website for

wider use. We also provided funding to Theme Researcher Fiona Nyhof, to lead a project to develop a guide for upcycled food manufacturers on how to get their innovative products onto supermarket shelves. This work involved postgraduate researcher Margaret Thorsen interviewing retail product category managers in order to understand their decision making criteria and then disseminating findings to Upcycled Food Network Members.

Otago Connection story - <https://www.otago.ac.nz/otago-connection/otago824131.html>

Meal Plan story - <https://www.odt.co.nz/news/dunedin/meal-plans-reduce-food-waste>

Food Waste Innovation collaborated with NZ Champions 12.3 on a New Zealand Food Waste Reduction Road Map. This was a six-month project funded by AGMARDT and Countdown where over 30 industry stakeholders were interviewed about food waste reduction in their organisation and at their stage of the supply chain. It also showcases 12 Champions of 12.3 as case studies and builds off discussions had at New Zealand's Food Waste Summit. This map paints a picture of barriers and opportunities to food waste reduction initiatives at each stage in the supply chain. The launch of the roadmap was celebrated on international Stop Food Waste (28th April) with an online webinar detailing the report.

To access the report:

<https://www.nzchampions123.org/resources>

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**METRICS AND MANAGEMENT
SUB-THEME UPDATE**

OTHER NEWS

Theme Industry Rep Francesca Goodman-Smith relocates for a new job.

Francesca Goodman-Smith has made the transition from industry back to research in crossing the ditch to take up her new role as Head of the “Transform” Research team for Australia’s Fight Food Waste Cooperative Research Centre. Goodman-Smith left her role as Waste Minimisation Manager at Foodstuffs NZ and relocated to Brisbane in April 2021. Francesca will continue to serve on the steering committee of Food Waste Innovation as our International Representative.



National Food Waste Summit, a success.

Te Hui Taumata Moumou Kai o Aotearoa – New Zealand’s inaugural Food Waste Summit, was held in Auckland on 22 March. The Summit was organised by WasteMINZ in collaboration with NZ Food Waste Champions 12.3. The Summit was deemed a huge success, bringing together food waste reduction experts including academics, researchers, food rescue organisations, food producer industry bodies, retailers, and hospitality experts. Theme Director Assoc. Prof. Miranda Miroso gave the opening summary for each of the four sections of the Summit, which followed the food supply chain from farm to fork. An article by Farmers Weekly did a great job of reporting on some of the key action points for reducing food waste raised at the summit.



Read the article - <https://farmersweekly.co.nz/section/agribusiness/view/food-waste-strategy-needed>

New Publications:

Goodman-Smith, F., Bhatt, S., Moore, R., Miroso*, M., Ye, H., Deutsch, J., & Suri, R. (2021). Retail Potential for Upcycled Foods: Evidence from New Zealand. *Sustainability*, 13(5). doi.org/10.3390/su13052624

Goodman-Smith, F., Miroso, R., & Miroso, M. (2020). Understanding the Effect of Dining and Motivational Factors on Out-Of-Home Consumer Food Waste. *Sustainability*. [doi: 10.3390/su12166507](https://doi.org/10.3390/su12166507)