

WASTE BYTES

University of Otago Food Waste Innovation Newsletter 5



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 sectors.

Note from the Director

Associate Professor Miranda Miroso



We recently hosted the Prime Minister's Chief Science Advisor, Professor Dame Juliet Gerrard, and Emily McCarthy, Senior Research and Policy Analyst from the Office of the PM's Chief Science Advisor (OPMCSA) who were in Ōtepoti to hear about research to inform their major 2022 project on food waste. The two-day visit was fantastic, with Dame Juliet reporting "We were impressed with the way that the research theme tackles food waste through so many lenses... The trip gave us so much to absorb, and the insights shared will help us bring together the evidence base in context and shape our recommendations." Ka pai to everyone who contributed to the visit; your commitment to the kaupapa is awesome and appreciated! While here, we were asked what policy recommendations we had. With a wish-list a mile long, pinning down just a couple is hard. Here are my top two. I recommend: (1) that NZ needs to develop a food waste reduction strategy to ensure a nationally coordinated approach; and (2) that more NZ-specific food waste research is essential to understand not only the size and scope of the food waste problem but also to test solutions and provide an evidence base to help with successful adoption of reduction solutions. The establishment of our Research Theme has provided a cooperative research approach that helps to ensure research agendas are shared to avoid duplication and to leverage findings. Looking forward, we're ambitious about

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where we go with this group once our institutional theme funding support ceases in a year's time. When we look across the ditch at Australia, we see precedent for the establishment of a long-term nationally supported Research Centre on Food Waste. Their 10-year Fight Food Waste Cooperative Research Centre is a national organisation, bringing together more than 60 industry participants, including state and local governments, academics, and 11 different research providers from around Australia to capitalise on Australia's food waste opportunities. Their research partners and industry participants undertake high-quality research to solve industry-identified problems through outcome-focused collaborative partnerships. Wouldn't the establishment of a well-resourced National Food Waste Research Center, co-funded by government and industry be an amazing outcome of the OPMCSA's project for NZ...

Ngā mihi, Miranda

RESEARCHER SPOTLIGHT

Professor Craig Bunt
Agricultural Innovation



What is your background?

Born on the West Coast, I grew up in Christchurch. I hold a B.Pharm (hons) and PhD (Pharmaceutics) from Otago. My first job out of university was in Hamilton with a veterinary pharmaceuticals company (we developed New Zealand's first FDA registered pharmaceutical), I then taught pharmaceuticals at Auckland University. Following this is when

I moved to AgResearch and was a co-PI on a large MBIE project researching agricultural applications of bacteria and fungi, then about 12 years ago I moved back to academia first at Lincoln University (animal science) and then to Otago University in September last year.

What is your leading research focus?

I don't think my research has a focus, it's quite unfocused but very applied; electro-spun nanofibers for fertiliser release and ocular drug delivery, bacteria formulations for probiotics and pest control, a good dose of material science, and pasture/rumen bio-stimulants. Probably the research most related to food waste I have been involved with is room temperature stabilisation of probiotic bacteria, being shelf-stable in a dry form there's no need to refrigerate to avoid spoiling.

What are you working on at the moment?

Research wise at the moment I'm looking at wool bio-composites (not carpet!) applications for the automotive and aerospace industries, wrapping up a project with a PhD student on ocular drug delivery, and a liposome/artificial DNA construct to mimic Mycoplasma bovis to help develop monitoring methods. I'm also working on developing the Agricultural Innovation programme and strengthening the University of Otago's connections to the agri-sector.

What interests you about food waste?

My interest in food waste is directed toward addressing the barriers to better utilisation of primary industry by-products, e.g. the misuse of drug act prohibits feeding hemp hulls to livestock. I'm also seeing similar barriers to food waste innovation that are also a problem for agricultural innovation. Typically these barriers can be a result of the small size of the New Zealand domestic economy, can be easy to come up with a good idea but next to impossible to find someone local who can make it.

POSTGRADUATE SPOTLIGHT

Sian Menson
Food Science



What is your research topic?

My research topic is the bittering potential of spent hops recovered from dry hopping in the fermenter. This is essentially taking the hops from the fermenter and put it back into boiling stage of the brewing process.

What brought you to Otago?

I have always had a massive interest in food since I was very young. This developed further during high school where Food Technology was a course. There I completed NZIFST CREST challenge in 2015 and a NCEA scholarship in food technology in 2016. After high school I wasn't sure about university and worked in hospitality for two years before I decided that that wasn't the satisfying food future I wanted for myself and decided to move my life to Otago to complete my BSc in Food Science in 2019.

What is the purpose of your research?

My research serves two purposes, most importantly it aims to provide sustainable and accessible opportunity to reduce food wastes, such a spent hops, in breweries. Secondly, it aims to breathe more life into a product that still has a lot left to give. Hops are poorly utilised when they are used to dry hop beer, meaning there is a lot of useful and valuable components left in the hops after this process, which is a waste of valuable resources at all levels of beer production. The research hopes to provide an outline of how to upcycle this type of hop for breweries that may want to adopt this sort of waste minimisation strategy.

What does your research involve?

My research is looking at how to retrieve and use hops when they have been recovered from a yeasty environment. To do so, I have developed a method to 'clean' the hops, as yeast can make a beer taste 'off'. I then looked at how to make the amount of bitterness of spent hop equivalent to that of a fresh hop pellet, as spent hops tend to lose some bitterness while in the fermenter. Once this is done, I will brew a beer to determine how well the spent hop acts as a bittering agent, and investigate any sensory changes that might have occurred by examining the volatiles components with GC-MS (a machine which separates compounds and helps us understand any changes in flavour).

THEME NEWS

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OPMCSA, DAME JULIET GERRARD VISIT

In July, Food Waste Innovation were honoured to host the Prime Minister's Chief Science Advisor, Dame Professor Juliet Gerrard, and Emily McCarthy for a two day visit to Ōteopti. This visit was in light of the OPMCSA major project for 2022/2023 on food waste. Throughout the two days, we put together a program of events and activities engaging with everyone from our own researchers and students, to other stakeholders at the University, to local stakeholders such as Dunedin City Council and Emerson's Brewery, to the New Zealand Food Waste Champions of 12.3, as well as the general public. As well as our panel discussion event (see next item), a few highlights included:

Theme-based Workshops. We held a series of three intimate workshops where researchers and students presented and discussed issues relating to the three workstreams set out by the OPMCSA project. Namely, prevention during production, processing, manufacturing, and distribution; prevention through consumer empowerment and retail and food service practice; and capturing value through food rescue, upcycling and recycling. Through these sessions, our researchers were able to relay their expertise on the opportunities and challenges, as well as give their recommendations for government in these areas.

Demonstrations of student projects. We showed Juliet and Emily through the Upcycled Food Lab and gave them a taste of some of the student projects happening in the new product development space as well as showed them innovative biometrics technologies being used to better understand how consumers respond to different types of upcycled food packaging

We are grateful to have contributed our expertise to this mahi and eagerly await the OPMCSA reports to come.

Media coverage: [Newshub](#), [Otago Daily Times](#), [Otago Bulletin](#)



Dame Professor Juliet Gerrard



From left to right: Emily McCarthy, Professor Phil Bremer, Associate Professor Miranda Miroso, Professor Dame Juliet Gerrard, Vice-Chancellor Professor David Murdoch, Pro Vice-Chancellor Sciences Professor Richard Barker, Professor Sheila Skeaff.

ENVISAGING AN AOTEAROA WITHOUT FOOD WASTE

During Dame Juliet Gerrard's visit to Dunedin, Food Waste Innovation in collaboration with NZ Food Waste Champions of 12.3 held a panel discussion event where the panelists, who included NZ Champions as well as Food Waste Innovation Researchers, were asked to give their take on an Aotearoa without food waste and the public

were invited to ask their burning food waste questions. Guests were also treated to a range of upcycled food tasters developed by our Upcycled Food Lab, or donated by our friends at the [Upcycled Grain Project](#) and [Rescued Kitchen](#).



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OTHER NEWS

Your 10c worth Campaign: A cohort of FOSC400 students completed their food waste module by developing an awareness campaign

about household food waste. Students Molly Goodisson, Lizzie Cunliffe, Lance Aya, Emma Roberts, Shaina Ebron, and Emily Doughy, developed "Your 10c Worth". Molly explains, "Essentially, we reached out to some iconic Dunedin foodie-influencers, sending them some meals to make and to promote them through social media. We made sure that the recipes used everything, including leftover ingredients, and that the ingredients were ones that are often wasted." They shared their campaign through the existing instagram handle @foodwasteflathacks. See the resource [HERE](#).



FOSC400 students ready to give out their campaign packs.

Submission to MfE "Transforming Recycling" report: in June, The Ministry for the Environment called out for submissions on its 'transforming recycling' report, which included a proposal to mandate the separation of food waste for businesses. Food Waste Innovation completed a detailed submission. The key points we asked MfE to consider were; 1) diverting food waste from landfill only deals with part of the problem, 2) redistribution strategies should be in line with international standards, and 3) wasted food is valuable (not just undesirable) and should be highlighted as such. You can view the full MfE report [HERE](#), and Food Waste Innovation's full submission [HERE](#).

NZIFST Conference: We had a large cohort of faculty and students attend the New Zealand Institute of Food Science and Technology conference in Rotorua in July. Our researchers presented on a range of topics from upcycled food, to on-farm food loss, to biometrics technologies capable of understanding consumer preferences. Congratulations to students Jess O'Connor, who came 3rd in the 3 minute presentation competition, and Brian Thong and Sian Menston who came 1st and 3rd respectively in the essay competition. Brian's winning essay "Upcycling: Great taste From Coffee Waste" is featured in the NZIFST magazine, View it [HERE](#) (pages 49-50).



Some of our researchers at the NZIFST conference

Student projects profiled in Otago Bulletin: Upcycled food related student projects have been profiled in recent weeks by the Otago Bulletin, including Honours student Sian Menston's project, [upcycling hops into a new brew](#), and PhD student Sarathadevi Rajendran using [ugly vegetables to recreate meat and dairy-like flavours](#).



Sian Menston and Anna Gatenby



Sarathadevi Rajendran

NEW RESOURCES

New Publication- Accessing Supermarket Shelves: Retail Category Managers Advice to Upcycled Food Manufacturers: This article, published in the Journal of Food Products Marketing, provides recommendations to 'upcycled food' manufacturers and suppliers that will help improve engagement with retail category managers. These, in turn, will hopefully increase the uptake of 'upcycled food' by retailers, thus supporting the growing upcycled food industry. Authored by M. Thorsen, F. Nyhof, F. Goodman-Smith, and M. Miroso. See the publication [HERE](#).



Other New Resources:

- [Vegan spent grain cake tutorial video.](#)
- [A guide to worm farming in your student flat.](#)
- [Food Waste and Climate Change video.](#)
- [An infographic on food waste policy and its significance to Māori.](#)

