

Environment Protection Authority

# NSW Health diversion and avoidance of food organics in hospitals

Organics Infrastructure (large and small) grants





NSW Health was funded \$500,000 through the EPA's Organics Infrastructure (large and small) grant program (2016, Stream 2) to assess diversion and avoidance of food waste in hospitals.

## Overview

The project enabled HealthShare NSW – the shared services organisation for NSW Health – to assess five onsite food organics processing technologies across eight metro, regional and rural hospitals. HealthShare NSW co-funded the project with an equivalent investment in staff resources and capital expenditure.

HealthShare NSW's Food and Patient Support Services serve 24 million meals in 155 hospitals across NSW.

Of the 11,358 tonnes of general waste landfilled in 2016 by these hospitals, over 50% was organic.

To address this, HealthShare NSW piloted multiple food service reforms and a new service delivery model to reduce food waste to landfill by more than 50%.

The funding allowed NSW Health to provide a holistic approach to food waste reduction in hospitals.

The project delivered value for money by adding to the work already being done through food service reform and has the ability to influence the way all hospitals in NSW dispose of their food waste.

## How the project was carried out

HealthShare NSW put in place a trial of five different types of food waste processing technologies at the following eight hospitals across NSW: Mona Vale, Royal Prince Alfred, Wagga Wagga, Fairfield, Liverpool, Grafton Base Hospital, Mount Druitt and Blacktown. One extra private hospital, St Vincent's Lismore, was added so the trial could get data on another commercially available technology.

Dehydration, maceration and liquidisation technologies were included in the trial, provided by the following suppliers: Closed Loop; Eco Guardians Pty Ltd; FeedMe Solutions Pty Ltd (Waste to Water); JJ Richards & Sons Pty Ltd; and Power Knot Australasia Pty.



Photo: HealthShare NSW

| Supplier & unit   | Process       | Hospital  | Outputs   | Installation   |
|---|---------------|---|---|--|
| Closed Loop CLO 30  | Dehydration   | Mona Vale   | Dehydrated food waste that resembles coffee grounds for periodic transportation off site for composting or land application. Land application is permitted only if testing and application conditions comply with relevant Resource Recovery Exemptions and Orders. | Usually installed outside the kitchen in the waste management area.<br>Ventilation required for condensate.<br>Electricity required.<br>Storage of outputs required.                       |
| Eco Guardians Pty Ltd<br>GaiaRecycle GC 400<br>GaiaRecycle GG 150 | Dehydration   | Royal Prince Alfred<br><br>Wagga Wagga            | Dehydrated food waste that resembles coffee grounds for periodic transportation off site for composting or land application. Land application is permitted only if testing and application conditions comply with relevant Resource Recovery Exemptions and Orders  | Usually installed outside the kitchen in the waste management area.<br>Sewer connection required for condensate.<br>Electricity required.<br>Storage of outputs required.                  |
| Feedme Solutions Pty Ltd<br>FMS Bio-EZ                            | Liquidisation | Fairfield<br><br>Liverpool                        | Liquid discharged to sewer if sewer authority permission received.<br>Trade waste charges or additional grease trap cleaning may be required.   | Usually installed near the kitchen.<br>Water and sewer connections required.<br>Electricity required.  |
| JJ Richards & Sons<br>Pulpmaster 5000 and 1500L holding tank      | Maceration    | Grafton Base<br><br>Mount Druitt<br><br>Blacktown | Sludge for periodic transportation off site for further treatment and use, often for soil injection.  | Often installed inside the kitchen away from food preparation areas. The holding tank is usually located outside for easy emptying.<br>Water connection required.<br>Electricity required. |
| Power Knot Australasia<br>LFC 200                                 | Liquidisation | St Vincent's<br><br>Private Lismore               | Liquid discharged to sewer if sewer authority permission received.<br>Trade waste charges or additional grease trap cleaning may be required.   | Often installed inside the kitchen but away from food preparation areas.<br>Water and sewer connections required.<br>Electricity required.   |

Putting the project in place was significantly delayed by installation issues and the requirement of extra financial and staff resources. Other issues included space, access, connection of utilities, complex and differing staff responsibilities and reporting lines. Importantly, the project identified both barriers and potential solutions to successfully putting in place recycling in a wide variety of circumstances.

Following installation of the equipment at each site a 90-day monitoring period was observed. During this time monitoring and data collection were done and outputs sampled. Some challenges in data collection and accuracy were experienced and most of the learnings were qualitative rather than quantitative.

The findings of the trial were collated and used to prepare selection criteria and guidelines for putting future organic resource technology in place in NSW hospitals.

## Outcomes

The project successfully reduced food waste to landfill in a hospital setting during the trial period. Over 24,000 kg of food waste was put through seven of the nine food waste processors in 90 days.

The trial identified valuable learnings to allow food waste processing technology in hospitals to be put in place and operated successfully. Learnings included:

- Energy consumption varies by technology type between <1kWh to >40kWh daily energy usage and should be considered alongside energy intensity (kWh) per output measure (e.g.kg of food waste treated). Similarly, water consumption was highly variable dependent on technology type and water intensity per output was considerably higher for maceration technologies.
- Before installing food waste processing technology, hospitals need to consider technology types and ease of use in the specific environment they are to be operated in, as well as environmental factors. Selection criteria should consider:
  - Geographic location of the hospital including the location of markets for outputs.
  - Capacity of the unit, including future hospital expansions and changes to waste quantities.
  - Approvals, like those needed with water authorities, for liquidiser technologies and/or application of solid output to land for other technologies.
  - Any system that requires land application of outputs requires a Resource Recovery Exemption and Order from the NSW Environment Protection Authority.
  - Any system that needs connection to a water utility sewerage system requires approval beforehand from the relevant water utility. Note: at the time of publishing the final report in 2019, the connection of equipment(s) that macerate, pulverise or liquidise solid waste, to a sewerage system in regional NSW is not permitted by Department of Industry - Water.)  
<https://www.sydneywater.com.au/content/dam/sydneywater/documents/food-waste-processing-anaerobic-aerobic-digestion.pdf>
  - Size and onsite location of the food processing unit including access, security and space.
  - Ancillary infrastructure needs including bins, bin lifters and trolleys.
  - Storage areas for outputs.
  - The type of food service delivery model impacts quantity of food waste likely to be generated.
  - Work Health and Safety requirements in operating the food processing units.
  - Source separation of the food waste including management of contaminants in the food waste stream.
  - Installation, including access requirements, utilities (electricity, water and sewage) and costs.

These findings and others will be used by HealthShare NSW to put in place a statewide organics diversion program and other trials in the future.

## Benefits, challenges and lessons learnt

### Benefits

- Staff engagement may increase with more awareness of positive environmental outcomes associated with their work.
- The range of technologies available provides several options to meet individual site needs.
- Use of onsite food waste processing technologies can reduce waste management costs but this needs to be balanced against any potential increases in labour costs, to make an informed decision.
- Seven of the nine food waste processing units were rated as having an ease of use and reliability score above 60% and four of the nine were rated above 80%.

### Challenges

- Each individual hospital has variations in needs and available space.
- Hospitals are complex operating environments with multiple health districts and support agencies.



- Competing selection criteria – positive performance for one facet of operation often means negative for another.
- Recycling materials (e.g., signage and training) can impact source separation. Developing best practice source separation materials can have a large impact on the quantity of food collected and reduction of contamination. This includes matching the actual food items to the recycling posters.
- Users are likely to view the experience positively if it's clean and odour-free.
- Regulatory requirements relevant to outputs can change.
- Despite agreeing to participate in the trial one technology provider did not provide data on energy and water use, or reliable data on food waste through the machine, or test results to show compliant output for discharge to sewer.

## Lessons learnt

- One size doesn't fit all.
- The combined capital, operating and installation costs need to be more affordable to improve return on investment at small to medium sites.
- The market is still immature and lacks the capability to put in place a statewide solution and servicing, using just one or two technology suppliers.
- The food service delivery model in a healthcare environment, or the size of portions in a retail environment, can reduce or increase food waste by over 50%.
- There is potential to divert food waste from landfill by donating leftover food to local charities, for example Food Bank and OzHarvest, providing this can be done safely.
- Workflows impact source separation: To maximise the quantity of food waste collected and minimise contamination, it is critical that hospital staff have enough time to source separate correctly. One of the biggest considerations is reviewing and redesigning; the less impact and food waste processing unit has on workflow the more likely staff will accept it.
- It is critical that any source separation system manages contamination in the food waste stream and must include regular training and spot audits to identify and eliminate contamination from the waste stream. Contamination can also have a detrimental environmental effect, with the output not being suitable for application to land.
- Comprehensive stakeholder engagement is a key success factor and regular ongoing training for staff is necessary.
- Sites relying on a 'sustainability champion' (supervisor, environmental services and food services site manager or similar, responsible for driving behaviour change and adopting new programs), recorded heightened acceptance and success of installation and utilisation of food waste processing unit.

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Published by:

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ISBN 978 1 922963 41 3

EPA 2023P4466

October 2023