LOVE FOOD HATE WASTE:
FOOD FESTIVALS AND FARMERS MARKETS

Pyrmont Festival Pilot
ABOUT THE PROJECT

The Love Food Hate Waste: Food Festivals and Farmers’ Markets project aims to reduce the amount of avoidable food waste currently being discarded at festivals and markets in the City of Sydney. The project aimed to achieve this by first engaging organisers and stallholders of farmers markets to understand the opportunities and challenges to reducing avoidable food waste and producing a suite of education resources. These resources were then piloted at Pyrmont Festival and will be implemented with food festival and farmers markets stallholders throughout 2016.

The Festival Pilot documented in this report (conducted April–June) follows earlier background research at Farmers Markets (Feb-April). Results of the background research are available in a separate report.

ABOUT THE AUTHORS

The Institute for Sustainable Futures (ISF) was established by the University of Technology, Sydney in 1996 to work with industry, government and the community to develop sustainable futures through research and consultancy. Our mission is to create change toward sustainable futures that protect and enhance the environment, human wellbeing and social equity. For further information visit: www.isf.uts.edu.au


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ACKNOWLEDGEMENTS

Thanks to our project partners:

Thanks also to all the stallholders who participated in the research.

This project is supported by the Environmental Trust as part of the NSW Environment Protection Authority’s Waste Less, Recycle More initiative, funded from the waste levy.

INSTITUTE FOR SUSTAINABLE FUTURES

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SUMMARY

This pilot aimed to trial a process for engaging festival stallholders, organisers and other key stakeholders (e.g. consumers, waste contractors) in order to reduce avoidable food waste at festivals. Avoidable food waste at festivals occurs during stallholders preparation and serving of food, and secondly during consumption by festival visitors. Specifically, the pilot tested preliminary findings from the Background Research, piloted a communication and engagement process, and, surveyed stallholders for their knowledge, confidence and ease of participation, to ultimately inform the development of guidance resources.

The pilot was ultimately deemed successful by the festival organisers and considered of interest and easy by participating stallholders. However stallholders and organisers are typically time and resource poor, which created several challenges that would need to be overcome for future initiatives. This pilot has now informed the development of online guidance material to support both organisers and stallholders.

Key recommendations

Recommendations for undertaking food waste avoidance initiatives at Festivals include:

- **Recommendation 1:** It is worth developing food waste avoidance initiatives at festivals, despite suggestions that stallholders don’t generate waste. However, ideally this should be undertaken in an integrated way as part of broader sustainability initiatives at a Festival, to maximise participation, momentum and ultimately impact.

- **Recommendation 2:** Engage organisers as key entry point to develop initiative. Organisers in turn are responsible for engaging stallholders to advise and support them in developing and implementing stallholder action plans.

- **Recommendation 3:** Online guidance material to support both stallholders and organisations can play an important role and is worth developing, but importantly the material is intended to support rather than replace the need for direct stallholder engagement.

- **Recommendation 4:** Measuring a baseline of food waste generation by stallholders and consumers at Festivals is a useful way to: a) inform the design of the food waste avoidance strategy, b) estimate cost savings from reduce waste collection, c) evaluate the effectiveness of the initiative once implemented.

- **Recommendation 5:** Engaging consumers before (e.g. via web and social media) and during the Festival (e.g via an info stall) is useful to both: a) promote the sustainability-related food waste avoidance initiative that will be taking place, including what stallholders are doing, and b) encouraging consumers to participate directly if there are front-of-house food waste bins, and indirectly by providing resources for households to reduce food waste generation.

- **Recommendation 6:** Undertake a further pilot focused specifically on testing an approach to engaging organisers which enables them to take responsibility for engaging stallholders.

Final project outputs

The suggested guide for Organisers to engage stallholders and develop a food waste avoidance strategy is available at [www.foodstallsavers.org.au/organisers](http://www.foodstallsavers.org.au/organisers).

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1 INTRODUCTION

ABOUT THE PROJECT

The Food Waste at Festivals and Farmers’ Markets project is a Love Food Hate Waste project targeting small food retail and food service businesses, which aims to reduce the amount of avoidable food waste currently being discarded at farmers markets and food festivals in the City of Sydney.

Full of fresh and delicious food, farmers’ markets and food festivals are places where people interested in local and sustainable food gather. A unique aspect of these markets and festivals is that they connect food stallholders who represent the entire food life cycle chain (from production and processing to food retail and food service) to consumers.

This makes them a unique place to target food waste avoidance activities, where effects could reach all aspects of the food system and impact on all stages in the food lifecycle.

The project has 3 phases:

- **Phase 0**: Background research
  - Desktop research
  - Stakeholder engagement
  - Draft toolkit

- **Phase 1**: Food festivals
  - Pilot at Pyrmont Festival
  - Evaluate pilot
  - Revise toolkit

- **Phase 2**: Farmers markets
  - Rollout to farmers markets
  - Evaluate rollout
  - Launch toolkit to NSW/Aus

This report documents the results of the Phase 1: Pilot of Food Stall Savers at the 2016 Pyrmont-Mudgee Food and Wine Festival.
Project partners

The project is a joint initiative between the Total Environment Centre, Smart Locale and the Institute for Sustainable Futures (ISF) at the University of Technology Sydney.

The project is supported by the Environmental Trust as part of the NSW Environmental Protection Agency’s Waste Less, Recycle More initiative, funded from the waste levy.

ABOUT THE FESTIVAL PILOT

The 2 day Pyrmont-Mudgee Fine Food and Wine Festival event in Pirrama Park was used to pilot the Food Stall Savers food waste initiative by the Institute for Sustainable Futures and project partners Smart Locale.

The Pyrmont-Mudgee Food and Wine Festival is keen to continue to increase the sustainability of the Festival, for which they have performance indicators, and being a fine food festival, food waste was considered to be an important issue. Prior to now, this festival has not included any food waste avoidance initiatives or support to its food stall owners. The organisers were therefore keen to participate in the pilot in order to facilitate learning around food waste as an issue amongst their event organisers and food stall owners, and to enable action to be taken to avoid food waste in preparing for the Festival and on site.

The aim of the pilot was to:

- Confirm the findings from the background research and, particularly, quantify the amount of avoidable food waste generated by SME food stallholders.
- Test the ease and effectiveness of an approach to engaging both organisers and stallholders in a food waste initiative which aimed to increase the knowledge, skills, confidence and commitment of festival stallholders to reduce food waste; and to inform the further development of guidance resources.
- Establish a baseline of food waste at the festival (if possible), and recommendations for processes and systems that could be put in place to reduce food waste.

The pilot is the first phase of the project, and will be followed by refinement and launch of the online engagement and education resources, and further engagement with food stallholders at markets and festivals across the City of Sydney in the second half of 2016.
Findings from past research

Initial background research by ISF with food stallholders at farmers markets in the City of Sydney revealed the following findings that are relevant to food festivals:

- Stallholders are time poor and it will be difficult to engage them directly with materials.
- Stallholders don’t consider food that is composted or otherwise recycled as “waste”.
- Interviews and bin inspections at markets suggest there is less avoidable food waste generated by food stallholders compared to the average of the traditional food retail and hospitality industry.
- Anecdotal reports by stallholders suggest that stallholder waste at festivals is greater than stallholder waste at farmers markets.
- Many resources exist for festival/event organisers to increase the sustainability of their event and/or reduce their waste. Few if any of these resources include avoiding food waste, meaning a gap currently exists for festival organisers.
- Resources for avoiding food waste by food businesses are currently geared towards the traditional store-based, food retail and hospitality industry and need to be translated into the context of festivals and events to be relevant to time-poor stallholders.

These findings helped to shape the approach of this pilot and the resources developed. More details on the above findings are available in the Background Research report:

2 APPROACH & METHODS

Overall approach

The Festival Pilot had three main components:

1. **Engagement with the festival organisers**: The festival organisers were project partners, and participated in a series of planning meetings to discuss and plan the stallholder engagement and festival interventions. They helped facilitate discussions with the event waste manager in order to measure food waste at the Festival via sample bin audits (to quantify the festival equivalent of ‘plate waste’).

2. **Engagement with food stallholders**: All food stallholders were initially contacted via email by the festival organisers and then followed up with individual phone calls by ISF. Stallholders who indicated their willingness participated in an additional 1-2 phone calls and received a further 3 emails. At the festival, participating stallholders collected their food waste in individual, dedicated food waste bins which were then collected and measured by the ISF team (to quantify the festival equivalent of ‘preparation waste’).

3. **Engagement with consumers**: Festival goers were engaged via a physical stall over the 2 days of the Festival. They were both made aware of the efforts of the stallholders and the festival, and encouraged to take action themselves. Visual inspections were also undertaken of ‘front-of-house’ consumer waste bins. Four 240L red-lidden bins were chosen at random from various locations near the hot food vendors and were emptied and sorted into different types of waste. The amount of avoidable and unavoidable food waste in each bin was inspected.

Organiser engagement methods

Engagement with organisers for the plot was unique, as the organisers were initially engaged prior to the grant application as partners, and helped shape the application.

Formal engagement started with a project inception meeting in February, where the overall aims and approaches of the project and pilot were discussed and agreed. A second meeting was held in early April to specifically plan the components of the Pilot, including stallholder engagement, consumer engagement and festival-wide interventions. Following this, information was shared and tasks were assigned by phone calls and emails up until the Festival on the 14-15 May.

The final festival intervention implementation plan agreed is shown in Appendix B.

Stallholder engagement methods

Considerations

The background research undertaken with food stallholders at farmers markets identified that talking about stallholder “food waste” was not a particularly effective approach for a number of reasons:

- stallholders don’t always consider food waste that is composted, fed to animals or otherwise recycled to be “waste”
- some stallholders were defensive when questioned about whether they waste food
- many stallholders believe that they don't generate any (or very much) food “waste”.

Use of the word “waste” was therefore avoided as much as possible in the early stages of engagement. Instead, the project communicated the key focus of the Pilot to stallholders as
FOOD WASTE AT FESTIVALS & MARKETS: PYRMONT FESTIVAL PILOT

the “lifecycle of food products” sold at the Festival, with a particular interest in the “fate of excess, surplus or damaged food”.

The project was broadly guided by a Food Waste Hierarchy as the framework for conversations about the fate of food, to introduce the concept of food waste (and loss) as ‘food that is ultimately not consumed by humans’.  

Food waste hierarchy graphic used in communications

![Food Waste Hierarchy Graphic](image)

In addition, rather than indicating that the research aimed to uncover sources of food waste by stallholders, the project communicated that the research with stallholders was to identify the efforts and practices of stallholders that lead to less/no food waste.

Planned approach

Based on the above considerations, the purpose of the engagement with stallholders was communicated as being:

- to understand the fate of food products sold at the fair: from production to consumption
- to identify and promote the great initiatives they may already be undertaking
- to improve practices where possible
- to evaluate the effect of the project on their business, through a before and after survey.

Stallholders were encouraged to participate by communicating the following benefits:

- Names of all participants will be advertised in all preceding communications regarding the Festival and the project, including associated media by ISF and Total Environment Centre, as well as project partners such as 1 Million Women.
- At the Festival, a stall will explicitly promote the efforts of stallholders to Festival attendees, encouraging them to check out participating stalls.
- Signage and handouts will be provided to participating stalls to highlight their efforts to reduce food waste.
- All efforts of participating stallholders will be detailed in communications and media after the festival, and a video will capture the best efforts of participating stallholders as part of promoting the success of the initiative at the Fair.
- A discount of 25% off the 2017 stallholder fees will be awarded to the stallholder judged to have made the best efforts to participate in the project avoid food waste (this will include existing strategies and past actions)
- Participating stalls may save their business money on food and waste costs, and, help create better environmental outcomes by diverting waste from landfill.

Planned engagement journey

The original planned engagement journey included the following steps for stallholders.

**Planned stallholder engagement steps**

<table>
<thead>
<tr>
<th>Pre-Festival</th>
<th>At-Festival</th>
<th>Post-Festival</th>
</tr>
</thead>
</table>
| 1. Initial engagement and invitation | 5. Festival participation  
   o Signage  
   o Handouts  
   o Food waste collection | 6. Thank you and evaluation survey |
| 2. Stallholder research and baseline survey | | 7. Write up of case studies |
| 3. Introduction to resources | | 8. Communication of final results |
| 4. Discussion and confirmation of “action plan” | | |

Due to delays in confirming the stallholders for the 2016 Festival, initial engagement was split into two steps:

- **Preliminary research email and phone call**: for stalls who were part of the 2015 Festival and indicated their interest in being part of 2016. The phone call included half of the baseline survey. For those who were later confirmed as part of the 2016 Festival participants (10/14), the second half of the baseline survey was conducted as part of their Intervention phone call. The other 4 did not participate further.

- **Invite email and baseline call**: for stalls who did not participate in 2015 Festival (and therefore not in preliminary research) but who were later confirmed as participants in 2016. The phone call included the whole baseline survey. Note that 6 stalls included in the 2016 Festival did not receive an invite to participate because they were confirmed after this stage and the organisers did not advise ISF of their being part of the festival.

The final stallholder engagement plan agreed is shown in Appendix C.

**Actual engagement**

Apart from the change to initial engagement detailed above, the above plan was largely adhered to for all stallholders. Two additional changes to the initial plan were made during the course of the pilot in order to tap opportunities following emerging stallholder insights (shown in bold in the following table). These were:

1. **Replacing “action plans”** with simply outlining the interventions to occur at the festival (i.e. signage, food waste collection, and handouts) and developing case study handouts, to highlight and promote existing initiatives to Festival visitors and partners. This involved discussing potential actions with stallholders and identifying which ones they are already doing [with the aim of raising awareness of other potential actions]. They were also able to see the positive actions they were already taken promoted on the website.

2. **Withholding the introduction of guidance resources** to stallholders pre-Festival due to the lack of time that stallholders communicated, perceptions that they were already avoiding food waste (which would be verified with the waste audits) and considerations of low engagement. Instead after the Festival, when engagement was judged to be higher, stallholders were invited to view resources which they could now go on to use to continue to reduce food waste in their business.
Actual stallholder engagement steps

<table>
<thead>
<tr>
<th>Pre-Festival</th>
<th>At-Festival</th>
<th>Post-Festival</th>
</tr>
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<tbody>
<tr>
<td>1. Initial engagement and preliminary research</td>
<td>5. Festival participation</td>
<td>6. Thank you and introduction to resources</td>
</tr>
<tr>
<td>2. Invite and baseline survey</td>
<td>o Signage</td>
<td></td>
</tr>
<tr>
<td>3. Festival interventions (‘action plans’)</td>
<td>o Handouts</td>
<td>7. Evaluation survey</td>
</tr>
<tr>
<td>4. Development of case studies</td>
<td>o Food waste collection</td>
<td>8. Communication of final results</td>
</tr>
</tbody>
</table>

Details of engagement communications, materials and research are shown in Appendix C, D and E.

Waste measurement approach

Food waste at the festival was measured for both stallholders (‘back of house’ waste) and sampled from consumers (‘front of house’ waste). The purpose of the measurement was to understand the amount of avoidable and unavoidable food waste at the festival, and establish a baseline for the Festival where possible.

Stallholder food waste collections

Each participating food stall was given a green bucket to place inside their stall and was asked to place in it all food and food scraps that they would normally discard. The buckets were checked regularly throughout each day of the festival and collected when they were getting full. Buckets were then sorted into avoidable and unavoidable waste using the following definitions:

- **Avoidable**: if the item was or had at some point been edible (eg. unused ingredients, leftover products, burnt or damaged food, etc).
- **Unavoidable**: if the item would not generally be considered edible (eg. fruit peels, vegetable top and tails, seafood shells, etc).

The amounts of avoidable and unavoidable waste were then weighed and recorded for each stall. Where non-food items were found in the buckets these were disposed of before weighing.

Following the festival, stallholders with significant amounts of food waste were asked to provide further data on the size of their stall, in terms of number of meals sold, dollar value of ingredients and dollar value of sales (i.e. revenue). This data was used to adjust the absolute volume of waste into a relative figure to enable comparison between stalls and other hospitality/food service businesses.

Sorting and weighing stallholder food waste
Consumer food waste bin audits

Consumer food waste (ie. ‘front of house food waste, or ‘plate waste’) was measured through sampling a small number of bins carried out on general rubbish bins located near the hot food outlets.

Four red-lidded, 240L general garbage bins were selected at random by the garbage contractors and were emptied and sorted into their various types of waste. Food waste was separated into avoidable and unavoidable food waste, then weighed and recorded. A photo was taken of the sorted rubbish to enable comparison.

The original and preferred approach included weighing the full garbage bag prior to sorting to enable calculations on the weight of avoidable food waste relative to the total weight, to produce a figure equivalent to generally quoted data on consumer, hospitality and food retailer food waste. However the Festival’s waste service provider was unable to provide a free method for accurately weighing the garbage bags.

A potential method for estimating the weight of the bags from the photos is detailed in Appendix G.

Sorting and weighing consumer food waste

Consumer engagement methods

Consumers at the festival were engaged via a physical stall presence at the Festival which contained information about:

- the Festival Food Waste pilot
- the efforts of the stallholders participating in the pilot
- what they could do themselves at home to avoid food waste.

Examples of the materials handed out at the stall are shown in Appendix F.

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2 E.g. the 2013 National Waste Report states that 37% of waste sent to landfill by the food retail sector is food waste, and that 25-50% of corporate catering food ends up in landfill, while WRAP reports that 32% of waste sent to landfill by the Hospitality and Food Service industry is food. (Note however, that these figures are based on weight, not volume.)
3 RESULTS

A. FESTIVAL ORGANISERS

ORGANISER ENGAGEMENT

The key organisers from both the Pyrmont Festival and Mudgee Wine were committed to and engaged in the pilot, and this was considered essential to the pilot’s success. This commitment was partly attributed to the food waste avoidance pilot being well aligned with the festival’s sustainability goals/targets.

While the organisers felt the pilot was a great success from their perspective, they acknowledged that this was partly attributed to the ISF project team leading the way at each step, guiding both the organisers and the stallholders. In fact, the pilot involved ISF staff doing the majority of the leg-work (e.g. stakeholder engagement).

The organisers notes that in genera, event organisers are extremely busy and often under-resourced, making it difficult for them to provide extra time and resources to additional initiatives.

The organisers felt that reduced waste costs could be a strong driver for other festival organisers, however this ideally would need to be supported by evidence/ test cases. Benchmarking the magnitude of the issue (e.g. through waste audits) is also important.

The organisers felt that appropriately designed guidelines for both organisers and stallholders would be useful. Several upcoming festivals were also identified by the organisers that could potentially trial the toolkit once developed.

FESTIVAL INTERVENTIONS

Plans for estimating the baseline food waste generation at the festival did not entirely go to plan, in part due to miscommunication with waste contractors regarding whether the bins could be weighed or not.

Initial plans to explore options for food rescue were abandoned due to time pressures of key stakeholders, and the need to prioritise additional stallholder engagement.

Signage highlighting the food waste initiative was developed, however due to the set-up of the festival (e.g. few ‘crowd control’ barriers/ or set entry points) the visibility of signs was not as effective as hoped. Better understanding of the site is needed when developing and placing signage.

Video footage was taken on Sunday, capturing highlights of festival and participating stallholders. This is being developed into a video to support the online material.
B. FESTIVAL STALLHOLDERS

Stallholder results are categorised into 3 sections, broadly corresponding to the three original aims, as follows:

- **Engagement**: test the project approach for engaging stallholders – sets out the number of stallholders successful engaged and their feedback on the process.
- **Research**: confirm the findings from the Background research – sets out the new knowledge generated from the research with stallholders.
- **Participation**: establish a benchmark for the Festival – sets out the results of the bin audits and other festival initiatives, including stallholder feedback.

STALLHOLDER ENGAGEMENT

Level of engagement

Out of 25 potential stallholder participants, 19 (76%) were engaged and invited to participate, 15 (60%) contributed to the research to some extent and 10 (40%) participated in the pilot food waste collection. The following chart sets out the number of stallholders who engaged at each step of the process.

The main reasons for losing stallholders at each stage included:

- considering this to be a low priority compared to other competing demands (unwilling)
- being interested but not having enough time, or being overseas (willing but unable).

Effectiveness of engaging stallholder at each stage

Food stallholders at the 2016 Festival fell into 3 categories of stalls:

- **Hot food vendors**: Selling freshly prepared hot food (and drinks) on the day (e.g. burgers, gozleme, stir fries, etc)
- **Mudgee producers**: Selling pre-packaged produce from the Mudgee region (e.g. Honey, nuts, relish, chocolate, etc)
- **Mini pop up markets**: Selling local pre-packaged food products (e.g. confectionary).
The following chart sets out the participation rate for each type of stallholder.

**Participation by stall type**

<table>
<thead>
<tr>
<th>Stall Type</th>
<th>Participated</th>
<th>Willing but unable</th>
<th>Unwilling</th>
<th>Not invited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot food vendors</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Mudgee produce</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pop up produce</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Effort to achieve engagement**

Engagement with stallholders required a number of communications through different channels. In total:

- 73 emails were sent, plus 18 resent, totalling 91 emails
- 32 phone conversations were undertaken, plus 32 attempted calls, equalling 64 phone call attempts
- 10 visits during Festival plus 24 bin collections, equalling 34 face-to-face interactions.

The following tables sets out the number of stallholders who were engaged (or were attempted to engage) at each step of the project. This table represents the effort required to achieve the engagement and participation results detailed earlier.

**Total efforts to engage stallholders**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Email ³</th>
<th>Phone ⁴</th>
<th>Face to face</th>
<th>Online ⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total initiation emails and calls</td>
<td>24 (9)</td>
<td>15 (9:19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary research email and follow up phone call</td>
<td>14 (4)</td>
<td>10 (4:13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invite email and baseline survey phone call</td>
<td>10 (5)</td>
<td>5 (5:6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Festival interventions email and follow up call</td>
<td>18 (1)</td>
<td>11 (7:10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case study confirmation and follow up calls</td>
<td>11</td>
<td>3 (1:1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Festival visit and bin collection</td>
<td></td>
<td></td>
<td>10 (24)</td>
<td></td>
</tr>
<tr>
<td>Post-festival email, online info and follow up call</td>
<td>10</td>
<td>3 (1:2)</td>
<td>TBC</td>
<td></td>
</tr>
<tr>
<td>Evaluation email and online survey</td>
<td>10 (8)</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>73 (91)</td>
<td>32 (64)</td>
<td>10 (34)</td>
<td>6</td>
</tr>
</tbody>
</table>

³ Brackets indicate the number of emails that were resent
⁴ Indicates the number of stallholders who completed the phone call. Brackets indicates the number of stallholders who didn’t complete the phone call and the total phone calls attempted with them.
⁵ Indicates the number of stallholders who engaged (or reported engaging) with the online material.
⁶ Included 4 stallholders who did not participate in 2016 and are therefore not represented in the Figure.
Stallholder feedback

Six stallholders gave feedback on the engagement and pilot process. All six considered the individual phone calls with ISF to be extremely or very useful/interesting, as well as the ISF stall at the Festival, which promoted the initiative and the stallholder efforts. Four of the six considered the information emails and project information sheet to be extremely or very useful/interesting. The food waste factsheet had the lowest rating.

Interestingly, in contrast to the ‘usefulness’ rating above, when asked about their preferred channel for communications in future such initiatives, five indicated they would welcome emails, while only two indicated they would welcome phone calls.

Stallholder feedback on communication methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Extremely useful/interesting</th>
<th>Very useful/interesting</th>
<th>Somewhat useful/interesting</th>
<th>Not very useful/interesting</th>
<th>Not at all useful/interesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF phone calls</td>
<td>2</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ISF festival stall</td>
<td>2</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ISF emails</td>
<td>2</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Project info sheet</td>
<td>2</td>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>Case study flyers</td>
<td>2</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Food waste facts info</td>
<td>1</td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Stallholder preference for communications

- **83%** Emails
- **33%** Phone calls
- **17%** F2F at festival
- **0%** F2F before festival
- **0%** Other

Reflections

Reflections on this stage included the following, discussed further in section 4. Conclusions.

- Difficulties obtaining full list of stallholders upfront delayed and shortened the engagement process/
- Organisers, like stallholders, are time poor, hence it is challenging for them to facilitate timely communications with stallholders
- The intensity of required effort (e.g. series of individual phone calls) was greater than expected.
- Stallholder feedback indicates a challenge of balancing phone calls (rated more useful/interesting) and emails (rated preferred).
STALLHOLDER RESEARCH

As detailed in the methods, stallholder research was conducted in two stages: preliminary research with those stallholders who were part of the 2015 Festival, and a baseline survey for those stallholders who were part of the 2016 Festival. This research complements that undertaken in the initial background research with food stallholders at farmers markets.

In total 13 stalls completed the baseline survey (4 hot food vendors, 5 Mudgee producers, 4 Pop up produce).

Knowledge of food waste issues

82% of stallholders were able to list at least one of the four key environmental impacts of food waste, though none listed all the major impacts unprompted. The average number of impacts listed was 1.3.

Very few stallholders were familiar with the concept of a waste hierarchy, and none, once explained, were able to correctly guess at the actions at the top of the hierarchy.

When asked about the scale of food waste in Australia, stallholders were much better able to guess the amount of food waste generated by consumers at home, than the amounts of food waste associated with food retail and food service.

Stallholder knowledge of scale of food waste

<table>
<thead>
<tr>
<th>Amount of waste generated by food retail industry</th>
<th>Correct</th>
<th>Over estimated</th>
<th>Under estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of plate waste generated by consumers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of waste generated by consumers at home</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Importance of avoiding food waste

All 13 stallholders said that avoiding food waste was “very important” to them. When asked why, 4 stallholders mentioned the financial cost of waste, 1 stallholder mentioned environment, 1 stallholder mentioned food security and 1 said it “just makes sense”:

- “We can’t afford to have waste.”
- “Cost, as a business we don’t want to be wasteful.”
- “Ultimately it affects your bottom line.”
- “Impacts the bottom line [and] bad for environment.”
- “Food is an important commodity… while we are fortunate to have access to food in abundance in Australia, I am aware of food shortages overseas due to climate conditions… with social media and internet, we can see what the ‘other side’ is not getting… we all have a responsibility to manage and minimise food waste… We are privileged so we need to be grateful … it is our responsibility to not abuse our privilege.”
- “Just makes sense.”

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8 Increased landfill, leachate, greenhouse gas emissions, waste of input resources.
FOOD WASTE AT FESTIVALS & MARKETS: PYRMONT FESTIVAL PILOT

Amount of food waste
When asked about the amount of food waste their food stall business generates, 3 stallholders said “none at all” while a further 9 said “not that much”. One stallholder indicated that they generated “a little bit”. This is shown by stall type in the following chart.

Stallholder perception of food waste generation

<table>
<thead>
<tr>
<th>None at all</th>
<th>Not that much</th>
<th>A little bit</th>
<th>A fair amount</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Hot food</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pop up</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produce</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mudgee</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources of food waste
The preliminary research with 2015 Festival stallholders identified only two sources of avoidable:

- unforecasted bad weather - less than expected customers can result in more waste
- unknown competition - other stalls of the same type can reduce expected sales if stallholder not notified of competition in advance.

Hot food vendor sources of food waste

| Offsite prep waste | One stall has all fresh ingredients delivered to site on day, so no offsite or “pre-prep” waste
| Offsite prep waste | One stall brings ingredients but does all prep on site, so still no “pre-prep” waste
| On-site prep waste | One stall reported no on-site prep waste
| On-site prep waste | One stall reported only unavoidable food waste (cabbage cores, bones and trimmed meat fat)
| Excess/surplus ingredients | Two stalls said they never have ingredients that go to waste. One emphasized importance of order the right amount of ingredients from suppliers (ordered specifically for each event). The other stall orders ingredients in bulk, but has careful storage and does high frequency of events (ie. most days per week).
| Excess/surplus ingredients | One stall said it was inevitable that sometimes they would order more than they need and this would go to waste (because they had no means to transport home), but they do best to minimize by careful estimation.
| Surplus cooked product | Two stall make everything to order, so no unsold cooked meals
| Surplus cooked product | One stall preps small batches of food (eg. Dough, mince mix) then cooks to order, so practically no unsold prepared food
Samples

- One stall cooks samples of meals to display which are thrown out at end of the day.
- One stall has its food cooked right at the open front of the stall which acts as the sample/display.
- Two stalls use photos to display meals, rather than sample plates.

Other

No stalls reported any of the following causes of food waste:

- cold chain failures
- bruising/damaging of ingredients during transportation.

Efforts to reduce food waste

On average, stallholders listed 3.5 actions to minimise avoidable food waste. 35% of stallholders listed at least 5 actions. The most number of actions was 7:

Number of food waste avoidance actions taken by stallholders

The actions listed by stallholders who participated in the pilot are shown in the case studies in Appendix E.

Reflections and learnings

Reflections on this stage included the following, discussed further in section 4. Conclusions.

- Knowledge of food waste issues varies, but regardless, all stallholders consider avoiding it to be important. This confirms that knowledge and attitude are not necessarily related.
- Stallholders’ key reason for avoiding food waste is pragmatic: the cost of waste to business. This is an extrinsic motivation, which if activated in behaviour change initiatives can lead to reversion to old behaviours over time.
- Stallholders’ perception of generated food waste is low (as per background research). This requires verification.
- Stallholders are already doing a lot of actions to avoid food waste, and are more likely to engage with the initiative when it is framed as uncovering the ‘good news stories’ of what they are already doing.

Note: Research data also include some ‘demographic’ data on stalls such as experience with stalls, number of staff etc. The full results database can be made available on request.
STALLHOLDER PARTICIPATION

As set out in the Methods section, and detailed in Appendix E, participation in the Festival Pilot included participation signage for the stall, case study handouts for customers and food waste collection bins for measurement.

In total 10 stalls participated in the Festival pilot initiative: 4 hot food + 1 coffee, 3 Mudgee producers and 2 Pop up produce. The participating stalls are show below.

Participating stallholders⁹

Note ‘Love Dem Apples’ stall was not present on the second day of the Festival and so not represented in photos.
Food waste collection

The 10 participating stalls were given a special ‘food waste’ bucket to collect all of their food waste in. These buckets were then sorted into avoidable and unavoidable food waste.

Examples of stallholder food waste

In total, the stallholders produced 54.7kg of food waste, 33.4kg (61%) avoidable and 21.4kg (39%) unavoidable. The 4 hot food vendors were the only stalls to produce substantial amounts of avoidable food waste (see below). The 5 Mudgee and Pop up producers generated in total only 3kg of the food waste, including only 600g avoidable.

Total stallholder food waste collected

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Day 1 Bin" /></td>
<td><img src="image2.png" alt="Day 1 Bin" /></td>
<td><img src="image3.png" alt="Day 2 Bin" /></td>
<td><img src="image4.png" alt="Day 2 Bin" /></td>
</tr>
<tr>
<td><img src="image5.png" alt="Day 1 Picked" /></td>
<td><img src="image6.png" alt="Day 1 Picked" /></td>
<td><img src="image7.png" alt="Day 2 Picked" /></td>
<td><img src="image8.png" alt="Day 2 Picked" /></td>
</tr>
</tbody>
</table>
Hot food stall food waste

Amount of food waste

The 4 hot food stalls produced the majority of the collected food waste: 46.47kg of food waste. 70% (32.72kg) of this was avoidable (ie. edible food), while 30% (13.75kg) was unavoidable (ie. inedible food scraps). The amount of avoidable food waste generated by individual hot food stalls ranged from 2kg to 10.2kg. Figure A shows the amount of avoidable and unavoidable food waste by stall.

Amounts are likely to be related to the amount of food made and sold. Figure B therefore shows the amount of waste produced relative to different measures of food sold, as reported by the stallholders.

Quantity of hot food stall food waste

The above figures show quite a range in absolute and relative food waste. However information from previous Love Food Hate Waste research with cafes and restaurants shows that the range found here is at the lower end of the range identified for traditional food hospitality businesses.

Types of food waste

Avoidable food waste by hot food vendors mainly consisted of burnt or unused food. Unavoidable food waste included the inedible parts of food such as lemon peels, egg shells and meat bones.

Types of avoidable and unavoidable food waste identified

<table>
<thead>
<tr>
<th>Avoidable</th>
<th>Unavoidable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burnt rice</td>
<td>Coffee grounds</td>
</tr>
<tr>
<td>Unused churros</td>
<td>Lemon peels</td>
</tr>
<tr>
<td>Unused bread rolls</td>
<td>Vegetable peels and offcuts*</td>
</tr>
<tr>
<td>Unused bacon rinds</td>
<td>Egg shells</td>
</tr>
<tr>
<td>Sample burgers</td>
<td>Meat bones</td>
</tr>
</tbody>
</table>

* Some of the ‘unavoidable’ food waste might be considered “potentially avoidable”: food that is typically considered to be inedible, but which can in fact be consumed.

10 Note: One stallholder had a double stall. Their total waste shown in Figure A has been halved in order to enable comparison with the other single stalls. Amounts therefore do not sum to the total figure reported.

11 A coffee stall also participated. They generated no avoidable food waste and 5.2kg of unavoidable waste.
Producer food waste

Amount of food waste

Between the four producer stalls (2 Mudgee stalls, 2 Pop up producer stalls)\textsuperscript{12}, the amount of avoidable food waste generated was approximately 600g across the 2 days, with an additional 2.4kg on unavoidable food waste.

<table>
<thead>
<tr>
<th>Quantity of producer stall food waste (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidable</td>
</tr>
<tr>
<td>0.4</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>0.05</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

Types of food waste

The types of food waste are shown in the following table.

<table>
<thead>
<tr>
<th>Avoidable</th>
<th>Unavoidable</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Melted confectionary</td>
<td>• Nut shells</td>
</tr>
<tr>
<td>• Broken crackers (usually eaten by stallholder)</td>
<td></td>
</tr>
<tr>
<td>• Chocolate crumbs (usually eaten by stallholder)</td>
<td></td>
</tr>
</tbody>
</table>

Stallholder feedback

Pilot initiative

Following the festival pilot, 6 of the 10 stallholders completed a feedback survey. 5 out of 6 stallholders rated the Pilot overall as ‘Extremely’ or ‘Very’ easy to participate, and similarly for the food waste collection process.

Ease of participation

5 out of 6 stallholders also rated participation as ‘Extremely’ or ‘Very’ useful/interesting to participate in, while 4 out of 6 stallholders said they learnt something new from the pilot. All 6 stallholders indicated that they were ‘Extremely’ or ‘Very’ confident that they could reduce food waste further following the pilot.

\textsuperscript{12} One Pop Up produce stallholder generated one-quarter of a bucket of avoidable food waste on the first day, but this was accidentally thrown out by event volunteers before it could be collected and measured and is therefore not represented in the figures.
Usefulness of participation

<table>
<thead>
<tr>
<th></th>
<th>Extremely</th>
<th>Very</th>
<th>Somewhat</th>
<th>Not very</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful/ interesting to participate</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confident can further reduce waste</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments from stallholders about what they learnt include:

- “It makes us more aware as we stop to think about food waste.”
- “Am more aware of “best before dates” and working that into our processing.”
- “[Realise we need to] mind the BBQ better to avoid food being burnt.”
- “I’ve had the opportunity via this exercise to look more insightfully into any wastage.”

Future initiatives

In terms of improvements to the approach, most stallholder feedback was positive, e.g.

- “Keep on keeping on and contact more stall holders/food businesses”

One stallholder suggested that more engagement techniques could be added:

- “Maybe a workshop and competition (people love free stuff) that may engage more people”

When asked about the possibility of incorporating food rescue into future events, one stall reported having used food rescue charities at past festivals and being disappointed at how many of their festival stall ingredients which the charities don’t take.

Impact of pilot on stallholders

The evaluation survey provided some insight into the impact that the Pyrmont Festival pilot had on participating stallholders:\(^{13}\):

**Importance of reducing food waste:** prior to the pilot, 100% of stallholders said that reducing food waste was “very important” to them. Following the pilot, 2 (33%) said that reducing food waste was “extremely important” to them, while the remaining 4 (66%) said it was still “very important” to them.

**Change in knowledge of food waste issues:**

**Scale of food waste issue:** Prior to the pilot the majority of stallholders underestimated the amount of waste generated by the food retail industry and the amount of plate waste by consumers after purchasing food. (The majority correctly estimated the amount of waste by consumers at home.) Following the pilot, the majority of stallholders were also able to correct estimate the amount of plate waste generated by consumers. However the majority were still unable to correctly estimate the amount generated by the food retail industry.\(^{14}\)

**Food waste hierarchy:** Before the pilot few stallholders were familiar with the idea of a food waste hierarchy and none could correctly guess the key avoidance actions at the top of the hierarchy. Following the pilot, half the responding stallholders correctly identified the avoidance actions as the first two actions of the hierarchy. However the other half of

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\(^{13}\) With only 6 responses to the evaluation, quantitative comparison of before and after results is not advisable.

\(^{14}\) This may be because food stallholders are a unique subset of the food retail and food service industry and do not see information about the sector as a whole as relevant.
stallholders placed ‘feeding to animals/livestock’ above ‘eat yourself/donate to people in need’.

**Change in food waste avoidance behaviours:** When given a list of all possible avoidance behaviours (identified through the preliminary research) two (or 33%) of the six responding stallholders identified 3-4 new avoidance actions that they would consider implementing in the future.

**Number of avoidance actions reported by participants following pilot**

![Chart showing number of avoidance actions reported by participants following pilot]

**Further participation:** While half of the responding stallholders said they would ‘definitely’ or ‘probably’ be interested in doing a full food waste audit of their business, including preparation waste, two-third of stallholders said they would ‘definitely’ or ‘probably’ track the amount of food waste they generated ongoing. Two-thirds of stallholders also said they would ‘definitely’ or ‘probably’ be interested in seeing and using an online food waste avoidance toolkit.

**Potential for future initiatives by participants following pilot**

![Chart showing potential for future initiatives by participants following pilot]

**Reflections and learnings**

Reflections on this stage included the following, discussed further in section 4 Conclusions.

- Hot food stallholders produce substantial amounts of avoidable food waste at festivals than any other type of food stall. These are ‘food service’ stalls and should be the focus of ‘At festival’ food waste avoidance education and activities. Other stallholders are typically ‘food retail’ stalls and are likely to have more substantial amounts of avoidable food waste during the preparation stage and should be the focus of ‘pre-festival’ food waste avoidance education and activities.

- Further engagement with some of these stallholders is possible, if desired, in order to quantify pre-festival and post-festival avoidable food waste through a food order, and to get feedback on the online guidance material for stallholders.
C. FESTIVAL CONSUMERS

CONSUMER ENGAGEMENT

Consumer engagement components resulted in mainly positive results. The Food Stall Savers information stall run by the ISF project team was popular, with 137 people approaching the stall (78 Sat, 59 Sun). Consumers were interested in what they could do as food consumers and householders (87 tip sheets handed out), in addition to hearing about what stallholders were doing to save on waste. Many appeared well educated and/or interested in sustainability at large, including what UTS/ISF were doing in this space (29 people signed up to newsletters).

The component that did work as well was the selfie social media competition. The purpose was to encourage consumers to engage directly with participating stalls physically at the festival and on social media, in order to raise the profile of participating businesses. However the majority of people who approached the stall, when encouraged to participate said that they were not common social media users. Better understanding of the demographics of festival attendees is needed when planning a social media competition.

Consumer engagement stall and social media competition photos
CONSUMER BIN AUDITS

Due to the potential increased cost of having dedicated ‘front-of house’ food waste (organics recycling) bins, the bin audits focused on identifying the amount of waste that could potentially be diverted from landfill at future festivals.

Four 240L red-lidded, general waste bins were chosen at random and sorted into their component waste types. The photos indicate that the majority of waste in the general waste bins was either: recyclable material, food waste, or food serving ware that could be replaced with compostable alternatives. Therefore the majority of the contents could potentially be diverted from landfill via comingled or organics recycling.

The amount of food waste in each bin was weighed. The total food waste in the bins ranged from 1.5kg to 7.4kg, with avoidable ranging from 0.7kg to 4.7kg. On average 55% of the food waste in the consumer bins was avoidable.

Amount of food waste in consumer bins

![Graph showing food waste distribution in bins](image-url)