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FOOD WASTE & EVENTS

A closer look at the extent of the problem

xhebit: Sustainable Event Planning
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Title:
FOOD WASTE AT EVENTS: A closer look at the extent of the problem

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xhebit

Working towards a circular events ecosystem.

xhebit, Singapore's one-stop platform for Sustainable Event Planning, was launched in 2017 with the objective of helping the events industry transition to a circular events ecosystem. We provide an event planning guide, case studies & consulting services to help event organisers make informed decisions. Our services include sustainable event consulting, waste audits and research studies that help further sustainable event planning. xhebit is an initiative developed by EARTHYS Sustainability.

EARTHYS Sustainability

EARTHYS Sustainability specialises in formulating solutions that support a circular economy. Because behaviour shapes the success of environmental initiatives, we place importance on understanding the interplay between behaviour & sustainability, and how this can be utilised to solve challenges.

Our diverse group of academics and industry specialists bring a wealth of knowledge and deep expertise in areas such as psychology, technology, social impact and data science, amongst others. We believe, the importance of natural resources, however small, need not be compromised or side-lined in the pursuit of growth.

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EXECUTIVE SUMMARY

The food waste issue poses a number of problems, both at the national and global level. Landfill challenges coupled with negative environmental, social and economic impacts from edible food going to waste, make it a pressing issue. While steps have been taken to address retail and manufacturer food waste in Singapore, food waste arising from events has slipped below the radar.

This study looks at excess food and food waste from catered events to assess the extent of the problem. We used data from NUS and NTU Telegram food rescue groups, over a 6 month period to shed light on the problem.

Key Findings

1. A total of 199 catered events with excess food were captured in Telegram over 6 months, amounting to 33 events on average per month.
2. 909 trays of excess food were documented, on average 4 to 5 trays of excess food per event.
3. Of the different types of excess food identified, rice and noodles topped the list accounting for over 60% of the leftovers.
4. The total number of trays with excess rice was 115, and noodles 127.

Much of the challenges leading to food waste begins upstream at the decision-making stages involving both event organisers and caterers. These challenges can be broadly broken down into 2 categories: Systemic and Socio-Cultural Norms. Systemic issues include inefficiencies along the supply chain which can be addressed through tweaks to the system. However, socio-cultural norms, which run deeper, need to be addressed at the national level.

While we have attempted to provide a better understanding of the extent of the problem by exploring the underlying causes, we realise major data and knowledge gaps in event food waste exists. We hope this study paves the way for more in-depth work in event food waste.

1.0 INTRODUCTION

FOOD WASTE

Food waste is a pressing concern globally, and Singapore is no exception. Food waste poses environmental challenges, social impacts and financial losses. The production, packaging, and transporting of food uses a variety of resources, and when perfectly edible food gets thrown out, it is a waste of all of those resources.

In the last 10 years in Singapore, food waste from households and the food industry has increased by 40% to 763,000 tonnes in 2018[1]. This adds up to approximately 23% of total waste disposed of in Singapore[2].

One of the pressing issues surrounding food waste in Singapore has to do with the rapidly filling landfill at Semakau. Initially projected to accommodate waste till 2045, it is now expected to run out of space by 2035[3].

Food waste originates in a number of different ways, and catered events are one such source. Providing catered food for a variety of events is a standard practice. One of the consequences is excess food which often turns into food waste.

OBJECTIVE

This study looks at food waste from catered events to assess the extent of the problem.

[1] Food Waste by Towards Zero Waste https://www.towardszerowaste.sg/foodwaste/
[2] NEA launches year-long battle against food wastage https://www.straitstimes.com/singapore/nea-launches-year-long-battle-against-food-wastage
[3] Pulau Semakau by Wikipedia https://en.wikipedia.org/wiki/Pulau_Semakau

2.0 METHODOLOGY

(I) DEFINITIONS

Events – Used to refer collectively to any gathering of people – seminars, workshops, conferences, meetings etc.
Excess food – Food leftover after the intended event attendees have consumed what they wanted.
Food Waste – Food that is perfectly edible being thrown away.
Event Organiser – Used to refer collectively to anyone organising events, not just event professionals.

(I) DATA COLLECTION

Data from two social media groups in Telegram – NUS Buffet Response Team and NTU Free Food were used for this study. Events with excess catered food are photographed and posted on both groups with the corresponding NTU or NUS location. Students are then invited to finish off the leftovers. Between February 2018 and August 2018, the following information was captured on Telegram and compiled by xhebit

1. number of events with excess food
2. number of trays of excess food
3. their locations and dates

NOTE: Majority (>80%) of the trays with excess rice and noodles were standard sized chafing trays of 2.5 inch (8.5kg) and 4 inch (14kg). Other leftover dishes (meat, veggies, light bites, dessert) came in various sizes. Therefore, we are limited to providing quantity only in terms of tray numbers.

3.1 RESULTS

Table 1. Total number of events posted to telegram with excess food over 6 months from February to August 2018.

	NUS	NTU	Total	
Total no. of Events with excess food	140	73	213	
Total no. of Events with excess food photos	133	66	199	
Total Number of Trays with excess food*	549	360	909	
Average no. of trays with leftovers per event	4	5.5	4.6	
Types of Dishes (no. of times observed)				
Rice	63	26	89	32%
Noodles	69	25	94	34%
Staples (Meat & Veggies)	21	13	34	12%
Light Bites^ (puffs, sandwiches, fish balls, samosas)	27	16	43	16%
Dessert	9	8	17	6%

* Excess food was calculated as having at least 20% or more food leftover as estimated from the photographs.
^Light bites are part of tea reception.

KEY FINDINGS

1. A total of 199 catered events with excess food were captured in Telegram over 6 months, amounting to 33 events on average per month. *See Appendix for photos of events*.
2. 909 trays of excess food were documented, on average 4 to 5 trays of excess food per event.
3. Of the different types of excess food identified, rice and noodles topped the list accounting for over 60% of the leftovers.
4. The total number of trays with excess rice was 115, and noodles 127 for both NUS and NTU Telegram groups.

3.2 CASE STUDY

In order to gain perspective on the extent of excess food generated by catered events, we provide 2 scenarios based on the data compiled from Telegram. We utilise two tray sizes which are frequently used in catering:

- standard 2.5 inch tray which holds 8.5kg
- standard 4 inch tray which holds 14kg

Using a 30% leftover threshold, we calculated 2.6kg (2.5 inch) and 4.2kg (4 inch) of excess rice per tray. Using the 115 trays of excess rice in Telegram as a benchmark, total excess rice amounts to 293.3kg (2.5 inch) and 483kg (4 inch) – enough to feed 488 or 805 individuals[4] a day. The lost revenue in sales for caterers amounts to $2990 and $4830.

Table 2 Two scenarios quantitate the extent of excess rice.

Parameter	2.5 inch	4 inch
Total rice per standard tray (kg)	8.5	14
Total leftover rice per tray (30%) (kg)*	2.6	4.2
Total rice leftover from 115 trays (kg)	299	483
Lost Cost of wholesale rice ($)**	598	966
Lost revenue from rice (buffet pricing) ($)+	2990	4830
Lost water used in cooking rice (L)^	623	1006

* This estimate is based on observed amounts of leftover rice in Telegram.
**Wholesale price of rice averaged $100 for 50kg.
+Average cost of rice per pax is $1.50 and quantity per pax is 150 grams.
^One cup (180g) rice to 1.5 cups (375ml) water is used.

[4] Heath Promotion Board recommends an average of 6 servings of brown rice a day per person - each serving is 100g or ½ rice bowl. https://www.healthhub.sg/programmes/55/my-healthy-plate

4.0 ROOT CAUSES OF EXCESS FOOD

(A) HOW DOES EXCESS FOOD OCCUR?

Excess food is essentially upstream decisions which result in a downstream problem. Let's explore how inefficiencies within the system and decision-making, lead to excess food and food waste.

1. FOOD PORTIONS (upstream)

xhebit spoke to several caterers to get feedback on catering portions. Most caterers have a standard rice/noodle portion but they do vary this according to the order. Portions ranged from 150 to 250 grams per person. This range is the result of adjusting rice quantities according to the profile of the catered crowd (white collar *vs* blue collar), and type of event (tea reception *vs* lunch *vs* dinner). When asked about reducing rice quantities because it is too much when combined with a variety of other dishes, the solution offered by caterers was to divide rice into rice (50%) and noodles (50%). This doesn't actually reduce anything. Given the frequency with which excess rice/noodles occurs, current portions sizes need re-thinking.

2. ORDERING THE RIGHT QUANTITY (upstream)

The responsibility to calculate order quantity accurately (no. of pax) falls on the organisers as they know the event, while caterers only take orders. Feedback from caterers also echoed this point. Once attendance numbers are finalised, organisers usually factor in an attrition rate for unexpected absentees. Attrition rates differ from organiser to organiser with the more conservative opting for about 20% reduction, while others may opt for 10% or not at all. After this, caterers will factor in an additional buffer (increase) on top of the order quantity. This buffer is usually 10%, but can vary from 5 to 20%. In the event of changes in attendance numbers, caterers usually allow order quantity to be adjusted 3 to 5 days before the event. When asked if organisers tend to adjust quantities (by reducing) closer to the event date, all caterers responded "no". On the flipside, organisers are generally averse to food shortage and prefer excess over shortage, as they feel shortage reflects badly on them.

3. FOOD WASTE (downstream)

One of the constraints faced by organisers is the need to clear out leftover food by a certain time. This is often due to venue constrains where an event has to vacate the premises by a given time, or caterer constrains where trays have to be collected back. An additional constraint is the time limitation on what constitutes consumable food. NEA mandates that food be consumed within four hours from the time a cooked dish is placed between 5°C and 60°C[5]. These constrains nudge excess food into food waste.

[5] Guidelines for Eating Safely during Festive Season https://www.nea.gov.sg/docs/default-source/our-services/guidelines-for-eating-safely-during-festive-season.pdf

(A) UNNDERLYING PROBLEMS

The challenges underlying food waste can be broadly broken down into 2 categories: Systemic and Socio-Cultural Norms.

SYSTEMIC

Responsibility
From attendees to organisers to caterers - at no point is reducing food waste being taken on.

1. The culture of attendees practicing RSVP changes, if unable to attend, is not practiced.
2. Organisers do not emphasise the need for RSVP changes, nor do they inform caterers of changes.
3. Caterers are primarily focused on taking in orders, and their emphasis tends to be on preventing food shortage rather, than minimising food wastage.

Inefficiency
Buffers are factored in by the majority of caterers – this is done to ensure there is no shortage. However given the rate at which rice and noodles are in excess, this appears to be largely unnecessary. Also a "one size fits all" approach to portioning is too simplistic - people do not eat the same amounts.

SOCIO-CULTURAL NORMS

Our aversion to providing **insufficient** food at events is closely tied to the deeply seated "saving face" Asian culture. The basis of this culture lies in a combination of social standing, reputation and dignity[6]. This norm has held firm in earlier decades. However, the 21st century brings with it pressing concerns surrounding climate change, food security and landfill constraints. Thus, it is time for people and organisations to evolve past it, and recognise a new cultural norm embedded in environmental responsibility.

[6] Kim, Joo Yup & Nam, Sang Hoon. (1998). *The Concept and Dynamics of Face: Implications for Organizational Behavior in Asia.* Organization Science Vol.9, No. 4.

5.0 RECOMMENDATIONS

While institutes like NUS, NTU and SMU have an effective solution for reducing and/or eliminating excess food, for most other events, this may not be the case due to the constraints mentioned earlier. When it is not possible to divert excess food, it turns to **food waste**. Food waste is a waste of resources. Land, water, energy, manpower all end up as losses when food fit for consumption ends up as trash. Preventing food waste prevents negative loses. By prioritising and addressing upstream processes, we can reduce food waste **and** the effort needed to divert excess food downstream. In this section, we put forward several recommendations on how to address upstream management of catering.

1. Recalibrate and standardise rice/noodle portions

When offered a variety of meat, veggies and dessert as accompaniment, people end up consuming less rice/noodles as they have a preference for staples. In order for organisers to accurately gauge quantities according to their menu and their attendee demographic group, they need to understand serving sizes and have options to work with – otherwise it is hit or miss.

Recalibrate

Eating patterns (more at lunch vs less at dinner), food preferences (carbs vs protein) and non-standard meal times (not lunch or dinner) influence the consumption of food. Much like how hawkers offer small and medium food portions, rice and noodle portions should be offered in "sizes". Ordering food with a distribution of small, medium and large is better than a standard portion for all. This can be taken one step further by asking attendees for their preferred size during registration. This strategy has also been recommended for food retailers and manufacturers by Towards Zero Waste SG[1].

Standardise

By standardising rice and noodle portions across all caterers, it ensures that regardless of caterer, organisers will be able to estimate the quantity more accurately. This gives organisers more control over deciding food quantity, given that they know their event best. Coupled with input from caterers, food can be quantified better.

2. Decoupling rice/noodles from buffet packages

Buffets are primarily offered as packages. Order quantity is applied to all dishes including rice and noodles. One option is to decouple rice/noodles from the package, thus providing organisers with the option to order a different (reduced) quantity for rice/noodles. Example, 100 pax for Package A with 70 pax for rice. This may also help save costs for organisers while reducing waste.

[7] CEC. 2019. *Why and How to Measure Food Loss and Waste: A Practical Guide.* Montreal, Canada: Commission for Environmental Cooperation. 60 pp.

3. Change the default quantity

The current catering system defaults to 100% of serving size for rice/noodles, unless organisers pro-actively request less. Alternatively, the system could be reversed to defaulting to **50% of serving size, unless more is requested**. By adopting this measure, even without organisers verifying attendee counts, the chances of leftover food are minimised by default.

4. Catering budget pegged to Food Waste

For organisations that cater on a regular basis, an option would be to peg catering budget to the amount of excess food created in previous events. This will encourage organisers to ensure they actively confirm attendee turnout and adjust catering quantity pro-actively in order to avoid budget cuts. This would be applicable to NUS and NTU which cater on a regular basis.

5. Standard Operating Procedure (SOP)

Confirming turnout & Tracking food waste

The need to confirm turnout and adjust food quantity needs to become a standard operating practice when catering food, not just a thoughtful affair for the conscientious. Organisations need to pro-actively implement sustainable event planning SOP for all to follow.

Part of the SOP should be to track estimated, expected and final turnouts of attendees over time so that trends in **attendee turnout & food waste** can be understood, and catering quantities can be adjusted over time. This is analogous to organisations tracking recycling so that they can understand where improvements can be made.

6.0 MOVING FORWARD

Sustainability, food waste and landfill constraints are relatively recent challenges in an industry as old as societies. Adding a set of guidelines which address food waste have the potential to burden caterers and organisers. Instead of treating sustainability as a separate add-on, we need to find ways to integrate it into existing systems and processes. For instance, Health Promotion Board's (HPB) Whole-of-Government (WOG) Healthier Catering policy lays out healthier catering guidelines for government events[8]. By integrating HPB serving size recommendations with portion modifications and quantity, we can **merge** healthier eating with food waste reduction efforts. **Integration** is likelier to lead to more success, as businesses don't have to think about food waste separately.

Food waste is often the result of **inefficiencies**. Inefficient decisions are being made along the supply chain that result in waste. One way to tackle this is to encourage caterers to adopt an overarching **sustainable catering policy**. By addressing operations, decision-making and processes holistically, waste in various forms, not just food, can be addressed more effectively.

When having to choose between less food or excess, both organisers and caterers opt for excess. This is a play of both **socio-cultural norms** and not recognising that there is another option – **just enough**. The challenges that food waste poses in Singapore require us to re-shape our norms with urgency at the national level. Greater acceptance will ensure organisers and caterers are less concerned about backlash, and it will likely encourage them to be more conservative in their quantity estimates.

True extent of food waste from events

The events and associated food waste captured in this study are just a small subset of all catered events taking place on a daily basis in Singapore. The true extent of event food waste over the course of a year is likely to be many times higher, but is currently not captured or adequately addressed. We have attempted to provide a better understanding of the extent of the problem by quantifying excess food, but we realise major data and knowledge gaps in event food waste exists.

Measuring enables managing

In order to achieve significant reductions, we need to understand the depth of the problem. While much focus has been placed on retail, household and supermarket waste[1], events have slipped below the radar. xhebit recommends a food waste audit of events to understand the full extent of the problem. We also recommend a comprehensive study into the gaps and opportunities in creating a food efficient catering system for events.

[8] Healthier Catering Guidelines by Health Promotion Board (HPB) https://www.hpb.gov.sg/healthy-living/food-beverage/wog-healthier-catering-policy/about-the-healthier-catering-policy

7.0 APPENDIX

NUS - February 2018

NTU – February 2018

NUS - March 2018

NTU – March 2018

NUS - April 2018







NTU – April 2018



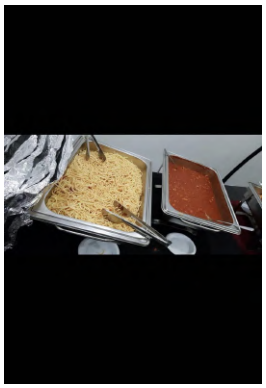



NUS - May 2018





NTU – May 2018




NUS - June 2018









NTU – June 2018




NUS – July 2018








NTU – July 2018







NUS – August 2018







NTU – August 2018





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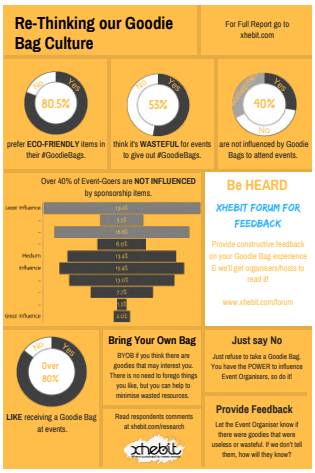
LPH Catering

Annie Chan of Red Box Events

UPCOMING REPORT

Comparing the Carbon Footprint of an Eco-Festival with a Regular Festival - A Case Study Of EARTHFEST 2019

OTHER REPORTS



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