



FOOD WASTE IN THE CAFE & RESTAURANT

SECTOR IN NEW ZEALAND



NEW ZEALAND CAFES & RESTAURANTS
THROW AWAY

24,372

TONNES OF FOOD ANNUALLY

that's
2.8 TONNES
PER BUSINESS
PER YEAR



61%
of
THIS FOOD WASTE
IS **AVOIDABLE**

WHY IS THIS FOOD WASTED?

60%
is
**PREPARATION
WASTE**
(waste created when
cooking e.g. vegetable
peelings, food cooked
incorrectly,
unsold food)



7%
is
**FOOD
SPOILAGE**
(food going bad
before it is used)

FOR **EVERY \$1 SPENT ON REDUCING** FOOD WASTE,
\$14 WORTH OF SAVINGS CAN BE MADE!

TOP TIPS FOR WASTING LESS FOOD

CAFES:
DISCOUNT FOOD
AT THE END OF THE DAY
OR
DONATE TO CHARITY



RESTAURANTS:
MONITOR
PORTION SIZES
AND
OFFER
DOGGY BAGS TO CUSTOMERS

For more information go to lovefoodhatewaste.co.nz





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EXECUTIVE SUMMARY

Food waste in the cafe and restaurant sector

In 2017/2018, research was conducted into the food waste generated by restaurants and cafes in New Zealand. The research found that 24,375 tonnes of food waste is generated per annum. Of this food waste 61% is avoidable and 39% is unavoidable e.g. eggshells, banana skins, bones etc.

The average cafe and restaurant generates approximately 2.8 tonnes of food waste per annum.

When cafes with a similar menu and offering were compared, the difference in the amount of avoidable food waste between the best and worst performing cafes was 43%, showing that there are clear opportunities for some cafes to reduce their food waste.

For this research, food waste was divided into three categories: spoilage, preparation waste and plate waste.

Spoilage occurs with the over-purchasing of ingredients or poor stock rotation, which causes food to spoil and be discarded before it is even used.

Preparation waste occurs in the kitchen and includes things like vegetable peelings, eggshells or toast that gets burnt. It also includes any unsold food that is left at the end of the day.

Plate waste is whatever customers leave behind on their plate uneaten.

Spoilage was found to be 7% of all food waste; preparation waste was 60% and plate waste was 33%.

For cafes and restaurants, which offer prepared food such as scones, sandwiches, pies etc., 30% of the preparation waste was unsold food.

By category, the food wasted the most in the sector is:

| | |
|-------------------|------------|
| Vegetables | 28% |
| Bakery | 26% |
| Meat | 13% |
| Fruit | 9% |

Whilst similar studies have been undertaken overseas in the UK and in Australia, it is not possible to make a direct comparison with their results.



Overview

It is now widely acknowledged that one third of the food the world produces goes to waste and that food is wasted at different parts of the supply chain for different reasons.¹

In 2011, the Food and Agricultural Organisation of the United Nations (FAO)² estimated where food was wasted in the supply chain for different regions of the world. At that time, there was no data available for New Zealand, so New Zealand was grouped together with Australia and North America.

Since 2013, WasteMINZ, in partnership with the University of Otago, has begun to analyse and calculate food waste at the various stages of the supply chain.

In 2015, WasteMINZ investigated household food waste through bin audits and online surveys.³ Households were found to waste 122,000 tonnes of food per annum, of which 66% was avoidable or potentially avoidable. All this food waste was sent to landfill, but the volumes of food waste diverted from landfill via composting or garbage disposal units is not known.



In 2016-2017, Francesca Goodman Smith, a master's student from the University of Otago, calculated the food waste generated by supermarkets in New Zealand through onsite audits and interviews.⁴ Supermarkets were found to waste 23,300 tonnes of food per annum, of which 66% was classified as avoidable. 77% of all discarded food measured in onsite audits was diverted from landfill (i.e. donated to food rescue charities, as animal feed, protein reprocessing and compost).

In 2017, a second master's student, Sarah Chisnall from the University of Otago, undertook research into the food waste generated by restaurant and cafes through bin audits and an online survey.⁵ Due to project constraints most of the audits were conducted in the South Island, so a second set of audits was conducted in Auckland by WasteMINZ and the results combined to generate an estimate of food waste in the cafe and restaurant sector for the whole of New Zealand.

1 FAO. (2011). Global food losses and food waste – Extent, causes and prevention.

2 FAO. (2011). Global food losses and food waste – Extent, causes and prevention.

3 WasteNot Consulting. (2015) New Zealand Food Waste Audits; <https://lovefoodhatewaste.co.nz/wp-content/uploads/2016/03/New-Zealand-Food-Waste-Bin-Audit-Report-2015.pdf>

4 Goodman-Smith, F. (2018). A quantitative and qualitative study of retail food waste in New Zealand (Thesis, Master of Science). University of Otago <https://ourarchive.otago.ac.nz/handle/10523/7972>

5 Chisnall, S. (2018). A Taste for Consumption: Food Waste Generation in New Zealand Cafes and Restaurants. (Thesis, Master of Dietetics). University of Otago. <https://ourarchive.otago.ac.nz/handle/10523/>



Goals of the research

The aim of this research was to quantify the amount of food wasted by cafes and restaurants in New Zealand.

Scope

Timeframe

The data for Auckland was collected over a six-week time period between April-May 2018. The data for the rest of the country was collected between August-September 2017.

Material type

All food (i.e. both edible and associated inedible parts) was collected and included in the audit. Due to logistical difficulties in collection and weighing, no drink or liquid waste was included in the audits, with the exception of teabags that had been disposed of in the kitchen rubbish bins.⁶ Specifically, coffee grinds, used cooking oil and any liquids disposed of down the sink were not included. Thirteen categories were used to define the various types of food waste. The categories used were taken from *Waste in the UK Hospitality and Food Service Sector - Full Technical Report*⁷

| FOOD TYPE GROUPING | FOOD ITEMS INCLUDED |
|-------------------------|--|
| Fruit | All types including inedible parts |
| Vegetables | All types including inedible parts |
| Potatoes | All types and forms (chips/fries/skin/whole/mashed) |
| Meat | All types and forms including inedible parts (flesh/bones/fat/skin) |
| Fish | All types and forms including inedible parts (flesh/bones/skin/guts) |
| Dairy | All types including dairy alternatives (cream, butter, cheese, soy/almond milk) |
| Eggs | Including inedible parts (eggshells, yolk, whites) |
| Bakery | Includes all types of bread, pastry, muffins, scones, rolls, tarts |
| Cereals & Grains | Including rice, pasta, couscous, noodles, other grains |
| Legumes, Nuts & Seeds | Including lentils, pulses, beans, nuts, seeds |
| Packaged Liquids | Any not already included in another category (e.g. liquid oils, soups, beverages. Excludes milk) |
| Miscellaneous | Any food waste that does not fit into any of the defined food categories (lollies, condiments, herbs & spices, coffee grounds, tea bags) |
| Unidentified Food Waste | Any visually unidentifiable food waste unable to be allocated to a food category |

Figure 1 13 categories of food waste



⁶ Most cafes audited had a separate rubbish bin for coffee grounds that was located near the coffee machine. These bins were not used for food waste so were not examined in the survey.

⁷ WRAP. (2013) Overview of Waste in the UK Hospitality and Food Service Sector



How the research was conducted

Boundary

The audits were undertaken in seven different locations around New Zealand, including both the North and South Island.

| LOCATIONS | NUMBER OF OUTLETS AUDITED |
|-----------------|---------------------------|
| Auckland | 11 |
| Whanganui | 1 |
| Manawatu | 1 |
| Taranaki | 1 |
| Otago | 4 |
| Oamaru & Timaru | 2 |
| TOTAL | 20 |

Destination

All food waste created over a 24-hour period was collected for the waste audits. For the Auckland audits, any food that was wasted would have either gone to landfill via a rubbish collection or if there was unsold food left over, some restaurants and cafes were sharing it with friends, family and staff. Only one cafe audited donated food to a food rescue organisation. For the audits undertaken in the rest of the country it is not known whether their food waste would typically have gone to landfill or whether it would have been composted or fed to farm animals.

In August-September 2017, a master's student from the University of Otago conducted nine bin audits at five restaurants and four cafes at six different locations around New Zealand.

In April 2018, WasteMINZ employed an intern to conduct audits of restaurants and cafes in Auckland. In total 10 cafes and one restaurant were audited.

The same audit protocols were followed in both sets of research. Cafes and restaurants were visited in person and asked if they were willing to take part in the research. If the cafe or restaurant owner stated that their business wasted no food, they were still asked to participate. This contrasts to the research undertaken in New South Wales where only businesses who had 30% or more of their waste as food waste were invited to take part in the research.



A set of three labelled rubbish bins were dropped off at the site to be audited. Kitchen staff were asked to place all food waste for a 24-hour period in the relevant bucket. The buckets were collected 24 hours later and taken offsite. In addition, all the rubbish bags which had been used during that same time period were also taken for auditing in case the staff had forgotten to separate out the food waste.⁸

⁸ A significant amount of food was found in the rubbish bins, so this step would be recommended for anyone contemplating similar research.



Results

The food was then weighed and categorised into 13 categories as outlined earlier.

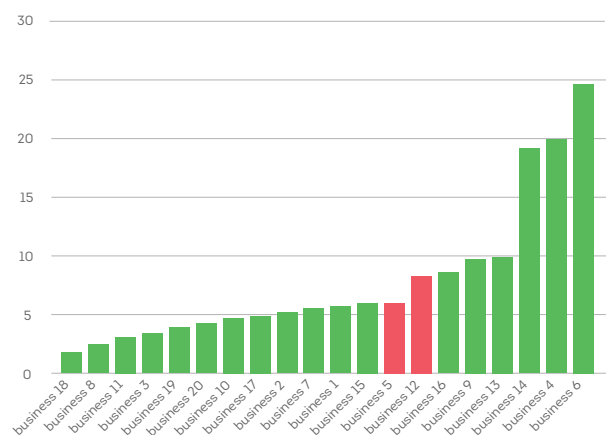
Food was also categorised into type of food waste (i.e. avoidable or unavoidable) and also by cause (i.e. spoilage, preparation waste and plate waste).

Overall, food waste averaged 7.9 kgs per day, which over a year amounts to 2.868 tonnes⁹ per cafe or restaurant.

In 2017, Statistics New Zealand recorded the number of cafes and restaurants as 8,499. Scaled up across the country this equates to 24,375 tonnes of food waste per annum.

The minimum food waste recorded for a cafe or restaurant was 682 kgs per annum and the maximum was 8.6 tonnes per annum.

TOTAL FOOD WASTE BY BUSINESS



Columns in red show where the average lies at 7.95 kilos per day

61% of food waste is avoidable and 39% is unavoidable (e.g. eggshells, banana skins, bones etc.).

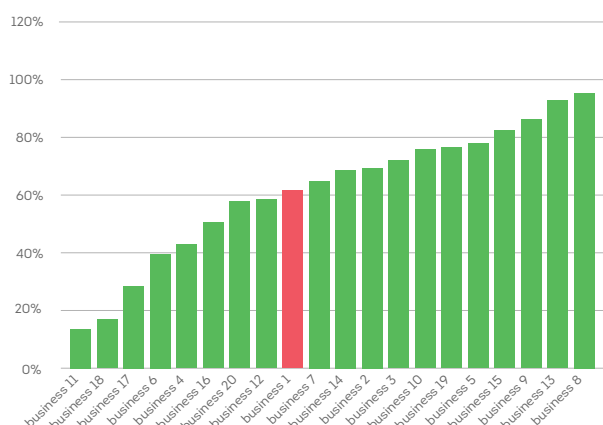
The minimum amount of avoidable food waste was 13%, rising to a maximum of 96%. This shows clearly that some businesses have lower avoidable food waste than others.

When cafes with similar menu offerings were compared, the difference in the amount of avoidable food waste between the best and worst performing cafes was 43%, showing that there are clear opportunities for some cafes to reduce their food waste.



⁹ This assumes a 363-day year closed Christmas Day and Good Friday only.

AVOIDABLE FOOD WASTE BY BUSINESS

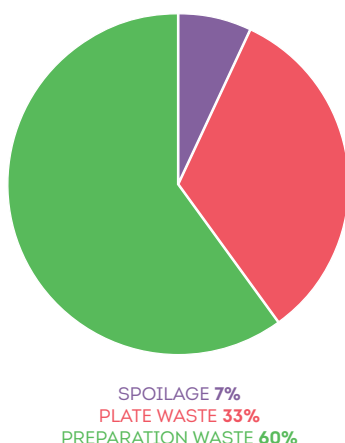


Column in red shows the average amount of avoidable food waste - 61%

Total food waste created seemed to be related to the size of the business and the number of diners served.¹⁰ However, no correlation was found between the size of business and the level of avoidable food waste, suggesting that other factors such as skill of the staff and awareness of food waste play a role.

Of the three types of food waste, spoilage was found to be 7% of all food waste; preparation waste was 60% and plate waste was 33%.

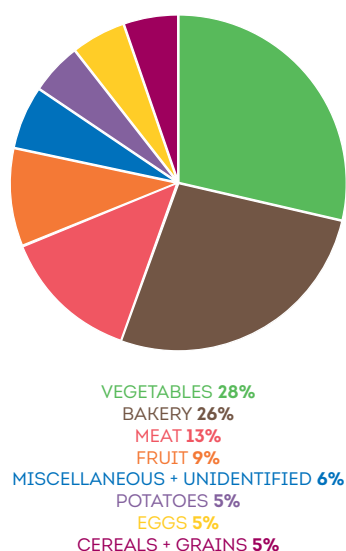
TYPES OF FOOD WASTE



For cafes and restaurants that offer prepared food (such as scones, sandwiches, pies etc.), 30% of the preparation waste was unsold food.

By category, the food groups wasted the most in the sector are: vegetables 28%, bakery 26%, meat 13%, fruit 9%, miscellaneous 6%, potatoes 5%, eggs 5% and cereals & grains 5%.

FOOD WASTE BY FOOD GROUP



Scaled up over the country this is equivalent to:

| FOOD WASTE CATEGORY | TONNES PER ANNUM |
|---|------------------|
| Vegetables | 6,800 |
| Bakery | 6,350 |
| Meat | 3,200 |
| Fruit | 2,100 |
| Miscellaneous + unidentified food waste | 1,600 |
| Potatoes | 1,250 |
| Cereals & Grains | 1,300 |
| Eggs | 1,250 |
| Dairy | 180 |
| Fish | 160 |
| Legumes, Nuts & Seeds | 160 |

¹⁰ Very few businesses had data on the number of covers served per day, so size was estimated visually by the researcher looking at seating and how busy the cafe appeared. Future studies would need to develop a more robust formula for calculating this.

Limitations of the research

Only food waste was analysed in this study. The *Food Loss and Waste Accounting Reporting Standard*¹¹ recommends including drink waste. However, due to the logistical difficulties of capturing and measuring liquid drink waste through bin audit methodology, drink waste was excluded from the study. It should be noted though that for cafes and some restaurants, coffee grounds are a significant source of waste. A free coffee ground collection service was offered by Tauranga City Council in 2016. They found that the average participating cafe and restaurant produced 1.8 kgs of coffee grounds per day which scaled up to 653 kgs of coffee grounds per outlet per annum.

Under the *Food Loss and Waste Accounting Reporting Standard*, food that is unsold but donated to food rescue is not considered as food waste. However, any unsold food is still a financial loss to the business. Interviews with businesses revealed that depending on the volume of unsold food left over at the end of the day, food may or may not be given away or thrown away. So the decision was made to count any unsold food as preparation waste as it is still a cost to the business. For the audits conducted in Auckland, a separate record was kept of what food was unsold and how much, whereas in the audits conducted in other parts of the country the figure was aggregated into preparation waste.

In total, only 20 businesses were audited for one day. This compares to similar research in the UK.¹² However, in Australia 79 businesses were audited over 5–7 days. The number of restaurants surveyed compared to the number of cafes was significantly lower. Additionally, the geographic spread of the audits was uneven. These results are therefore not statistically significant and are only indicative of the volume of food waste. Given the smaller number of restaurants surveyed compared to cafes, these results are likely to underestimate the level of food waste in this sector.

Only cafes and restaurants were audited for this research, so further research would need to be done into fast food outlets, pubs, bars and hotels to calculate the food waste for the whole of the hospitality sector.

¹¹ Very few businesses had data on the number of covers served per day, so size was estimated visually by the researcher looking at seating and how busy the cafe appeared. Future studies would need to develop a more robust formula for calculating this.

¹² Sustainable Restaurant Association surveyed 10 restaurants in 2010; Too Good to Waste – Restaurant Food Waste Survey Report (2010); WRAP surveyed 19 restaurants in 2013; WRAP (2013) Where food waste arises within the UK hospitality and food service sector: spoilage, preparation and plate waste. <http://www.wrap.org.uk/sites/files/wrap/HaFS%20sector%20spoilage%20preparation%20and%20plate%20waste%20FINAL.pdf>



Conclusion

There are opportunities to reduce food waste in the hospitality sector. This research, albeit with a small sample size, has shown that significant amounts of food waste are generated. However, some businesses create less food waste than others, despite having similar menus. Therefore, understanding what these businesses do differently and what they do to reduce their food waste is key.

A report produced by the Champions 12.3 found for every \$1 a business invests in reducing food waste, they receive a \$14 financial return. Furthermore, restaurants were identified as receiving the highest financial returns.¹³

Bakery provides the easiest opportunities for cafes and restaurants to reduce their food waste. 56% of all bakery waste (3,556 tonnes) was unsold food such as sandwiches, pies etc., foods that could be donated to food rescue or discounted at the end of the day for quick sale.

Focusing on portion sizes, the type and size of garnishes and side salads used and offering customers optional sides would significantly reduce plate waste.

For restaurants that often employ staff with a higher degree of culinary knowledge and training, repurposing preparation waste into other dishes, such as making sauces and stocks with vegetable peelings etc., would reduce waste.

Bread ends and bread crusts were challenging for all businesses making up 10% of all bakery waste (635 tonnes). No businesses audited had solutions for minimising waste from bread ends and whilst options such as turning them into breadcrumbs etc. has been considered, the volume of bread waste created far exceeded their ability to turn this into another product.

A significant amount of unavoidable waste is created by spent coffee grounds, 18% of all organic waste. The provision of food waste collections would greatly assist in the reduction of organic waste to landfill. In addition, encouraging food rescue initiatives, such as The Free Store in Wellington who collect unsold food from cafes at the end of the day and distribute it to the homeless, would reduce food waste and assist the less well off in the community.

Resources to assist businesses to measure and track their food waste and to provide targeted advice on reducing food waste would also be useful.

Finally, further research, to understand the strategies and practises of businesses who waste less food than average, would be useful in order to ensure those strategies and skills are taught at hospitality training institutes to train the next generation of chefs and restaurateurs.

¹³ Hanson C, Mitchell P. The Business Case for Reducing Food Loss and Waste: A report on behalf of Champions 12.3 [Internet]. Champions123.org website Champions 12.3; 2017 [cited 2017 Oct 20]. https://champions123.org/wp-content/uploads/2017/03/report_-business-case-for-reducing-food-loss-and-waste.pdf



Further reading

For more information on cafe and restaurant waste in New Zealand:

Chisnall, S. (2018). A Taste for Consumption: Food Waste Generation in New Zealand Cafes and Restaurants. (Thesis, Master of Dietetics). University of Otago. <https://ourarchive.otago.ac.nz/handle/10523/>

Jones, E. (2018). An investigation into food waste produced in New Zealand restaurants and cafes. (Thesis, Master of Dietetics). University of Otago. <https://ourarchive.otago.ac.nz/handle/10523/7924>

For more information on how to reduce food waste in your cafe and restaurant:

Your Business is Food
<https://www.lovefoodhatewaste.nsw.gov.au/in-business/your-business-food>

Wise up on Waste Toolkit
<https://www.unileverfoodsolutions.com.au/chef-inspiration/chef-training-and-resources/managing-food-waste/wise-up-on-waste-toolkit.html>

Hotel Kitchen
<https://hotelkitchen.org>

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