

# Research Proposal

## Measuring Food Waste in Prince George Restaurant: Volume, Model, and Effects

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# Introduction

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## Expected Results

- One-third of food is lost or wasted around the world[1].
- Around 1.3 billion tons of FWL is generated annually, and the rate is projected to grow by 44% per year by 2025[2].
- Canada creates about 35 million tons and the largest waste generator per capita in western countries in 2016[3].
- In BC, 40% of the waste to landfills is organic waste, the majority is produced from domestic waste[4].
- Limited number of studies have been conducted on the food supply side

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## Research Questions

- What is the average volume of food that is wasted during processing and consumption in restaurants?
- What is the extent of food wastage in Japanese restaurants in Prince George?
- What are the main factors contributing to food loss and waste?
- To what extent is a social or environmental impact from food loss waste generated by a single restaurant?
- What approaches are Japanese restaurant operators taking to reduce food waste generation?

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## Definition of FLW

- No universally accepted definitions of FLW

Organizations	Definition
Food Loss by FAO	harvest/slaughter/catch
Food Waste by FAO	retail/ consumption
Food Waste by EU	Food removed from FSC
Food Loss by US	unused product from agri
Food Waste by US	Subcomponent of FL

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## Five Measurements of FLW

Method	Note
1. Self-report	individuals report FLW low cost but high dropouts
2. Survey	collect FLW by interview or questionnaire cost-effective but not accurate
3. Composition	sample and analysis at lab need special knowledge and equipment
4. Mass balance	material flow analysis limitation in waste factor assumptions
5. Direct weight	directly measure FLW most accurate but high cost

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## Statistic Model

- **Multiple Linear Regression**
- Ad: Simple and interpretable
- Disad: Not suitable to time series
- Disad: Stationary and Spurious
- **Bayesian Modelling**
- Ad: Flexible and adaptable to time series data
- Disad: No appropriate result in some cases

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## Effects of Food Loss and Waste

- **Economic Loss:**
  - labour, material resources, time, and energy
- **Environmental Impacts:**
  - water scarcity, soil erosion, and GHG



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## Hypotheses

- Bullet 1
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- Bullet 3

# Methods

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### Study Area

- Japanese restaurant in Prince George
- open for lunch and dinner for three hours each, six days of a week

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## Sample Collection



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### Sample Size

- By Power analysis, 95% CI and 10% margin of error with most conservative estimate says 97 samples[]
- one in ten rule (rule-of-thumb) suggests 100 observations with 10 predictors[]
- Green's rule states 130 samples with 10 predictors[]

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## Variables

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## Model

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# Expected Results

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### Current Progress

- From Sept. 16, four months.
- Collected over 100 samples.
- 
- Bullet 3