Prevention of Consumer Food Waste

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Kansas Local Food Summit
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1. Overview

- People waste food

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1.1. Food Policy Council

- Douglas County Food Policy Council

- Purposeful Plates program in 2019
  - » prevent food waste
  - » create intervention
    - people waste food
    - local people are hungry

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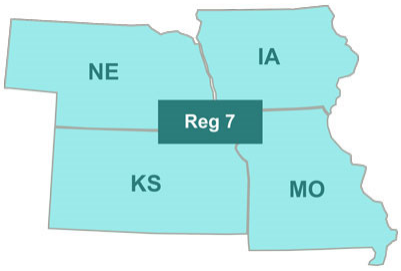
1.2. EPA Region 7

- Environmental Protection Agency Region 7



- Memorandum of Understanding with KU
  - » collaborative research
  - » community liaison - technical

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2. Interventions to Prevent Food Waste

- Restaurants
- High school cafeteria
- University sorority
- Sports venue
- Home

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3. Restaurants

- 3.1. Assess effects of restaurant interventions

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3.2. 1st Restaurant

- 3.2.1. focus: assess effects of intervention
  - » food waste
  - » causal channels
    - purchases

    - leftovers taken home

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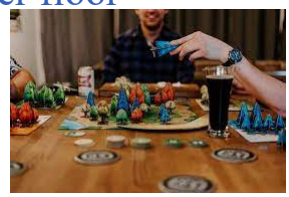
3.2.2. Context of 1st Restaurant

- RPG Restaurant

- Two floors

- More structured games on upper floor



- Lunch: weekend
- Dinner: Tuesday - Sunday

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3.2.3. Field Experiment Design

- Control period (1 week) [March 8 - 14]
- Intervention period (2 weeks) [March 15 - 28]

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3.2.3. Field Experiment Design

- Intervention device
  - » message in menu rolodex
  - » placed in front between parties

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3.2.3. Field Experiment Design

- Data
  - » Purchases (N=558)
    - by party (i.e., table, group of patrons)
  - » leftover container (N=895)
    - by payer
  - » Waste (N=154)
    - by floor and 2-hour interval

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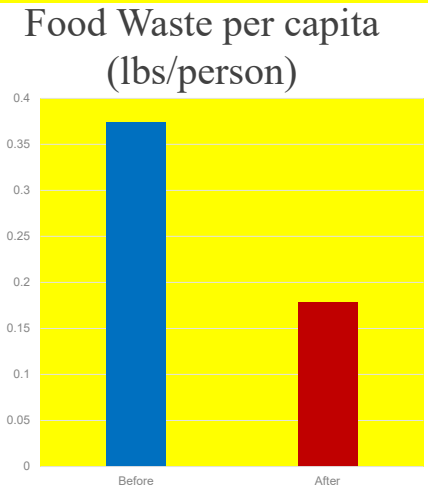
3.2.3. Field Experiment Design

- Trends



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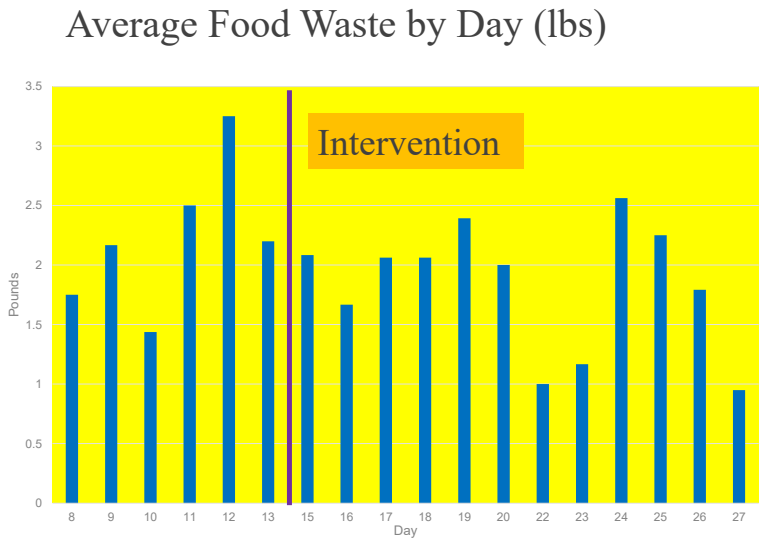

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3.2.4. Statistical Analysis

- Consumer Waste
  - » absolute
  - » per capita
  - » per $
- Causal Mechanisms
  - » purchases:
    - Food $, Food + Beverages $
    - Food $ / # (~ quality)
    - Board Games $
  - » leftover to-go container

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3.2.4. Statistical Analysis

- Controls
  - » workday vs weekend
  - » lunch vs dinner
  - » floor
  - » # of patrons (party size)

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3.2.5. Statistical Results

Variable	Food Waste (logged)	Food Waste per $	Food Waste per capita	Food Waste Absolute
Intervention	- 0.597 ** (0.293) [0.043]	- 0.040 *** (0.015) [0.011]	- 0.168 ** (0.070) [0.018]	- 0.470 * (0.271) [0.085]
Inclusion of Control Factors				
Weekend	X	X	X	X
Dinner	X	X	X	X
Patron count	X	X	X	X
Upper Floor	X	X	X	X
Regression Parameters				
N	154	154	154	154
Adjusted R^2	0.276	0.437	0.286	0.407

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3.2.5. Statistical Results

- Causal Mechanisms: Purchases

Factor	Food (logged)	Food + Beverage (logged)	Food Quality ($/#)
Intervention	- 0.599 ** (0.281) [0.033]	- 0.578 *** (0.225) [0.010]	0.796 *** (0.275) [0.004]
N	558	558	558

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3.2.5. Statistical Results

- Causal Mechanisms

Factor	Leftover To-Go	
Intervention	0.016 (0.023) [0.495]	No effect
N	895	

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3.2.5. Statistical Results

- Placebo Test: expect no effect and none shown

Factor	Board Game Purchases
Intervention	0.780 (1.093) [0.476]
N	558

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3.3. 2nd Restaurant

- 3.3.1. Focus
- Assess effect of restaurant intervention on food waste
- Explore influence of party size on effect

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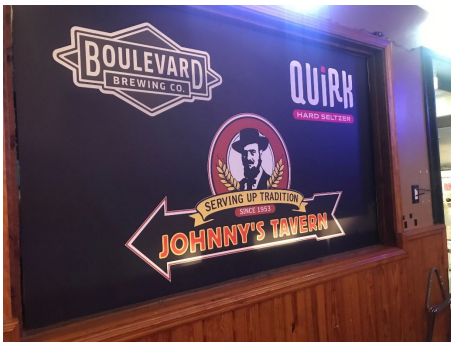
3.3.2. Context of 2nd Restaurant

- Johnny's Tavern – North



- Dinner only, Weekday only

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3.3.3. Field Experiment Design

- Control period (6 meal sessions)
  - » May 1, 8, 10, 31
  - » June 5, 21
- Intervention period (3 meal sessions)
  - » June 26, 29
  - » July 6

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3.3.3. Field Experiment Design

- Intervention device
  - » message in table tent

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3.3.3. Field Experiment Design

- Party-level Data (N=325)
  - » waste
  - » party size
  - » transaction details

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3.3.4. Statistical Analysis

- Ordinary least squares regression
- Equation
  - » Y = food waste
  - » V = intervention (0,1)
  - » P = party size
    - $Y = a + bV + cP + d(V \times P)$

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3.3.4. Statistical Analysis

- Controls
  - » Day of week
  - » Time of day
  - » Location (table vs. bar)

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3.3.5. Statistical Results

Variable	Magnitude	p-value
Intervention	0.0340	0.637
Party Size	0.0427 ***	0.000
Intervention x Party Size	- 0.0329	0.131

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3.3.5. Statistical Results

Average Waste: 0.49 ; Average Party Size: 3.5

Party Size	Marginal Effect	p-value
1	0.0011	0.984
2	-0.0318	0.505
3	-0.0646	0.171
4	-0.0975 *	0.082
5	-0.1304 *	0.065
6	-0.1633 *	0.065
7	-0.1961 *	0.068
8	-0.2290 *	0.073
9	-0.2619 *	0.077
10	-0.2948 *	0.081

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4. High School Cafeteria

- 4.1. Setting

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4.2. Field Experiment Design

- Timeframe
  - » control period (5 days)
  - » intervention period (5 days)
- Groups
  - » Lunch Period 1: control
  - » Lunch Period 2: base treatment – table tent
  - » Lunch Period 3: extended treatment
    - donation box
      - » at cashier, on way to disposal

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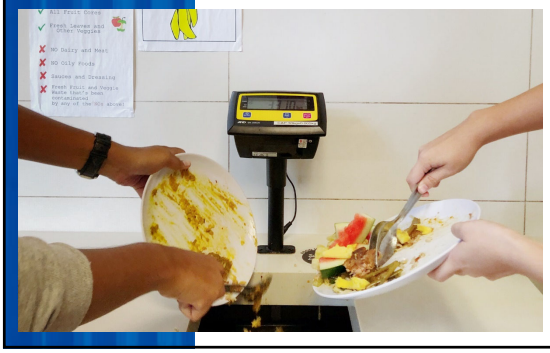
4.2. Field Experiment Design

- Student-level Data
  - » Waste (N=2,844)
  - » Purchases (N=7,732)



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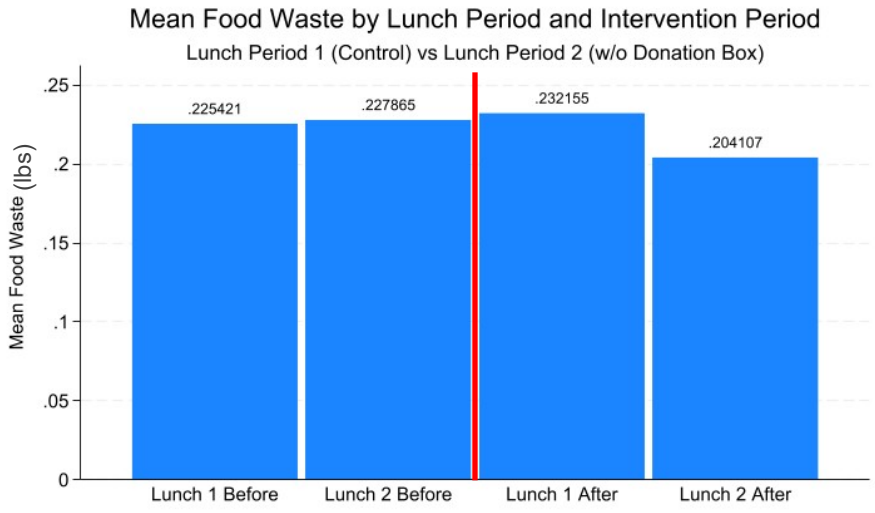
4.3. Statistical Analysis

- Comparisons: Before-After, Control-Treated



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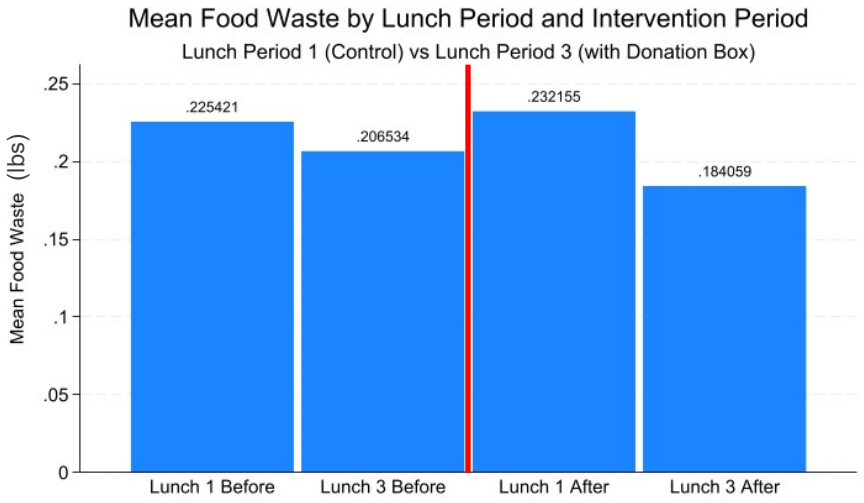

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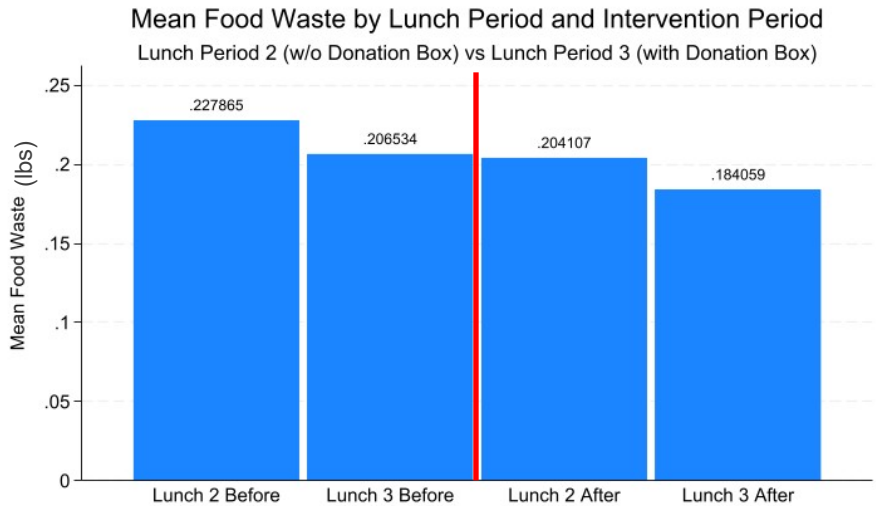

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5. Sports Venue

- People waste food at sporting events

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5. Sports Venue

- Sporting KC
- KC Chiefs
- KC Royals
- KC Current

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5. Sports Venue

- Tour stadium
- Analyze survey data
- Interviews
- Focus groups
- Baseline survey
- Field experiments
  - » onsite
  - » remote
- Follow-up survey

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5. Sports Venue

- World Cup 2026

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6. In-Home Food Management

- Survey of households
  - » Lawrence, KS
  - » October 2023
  - » pilot
  - » field experiment in 2025

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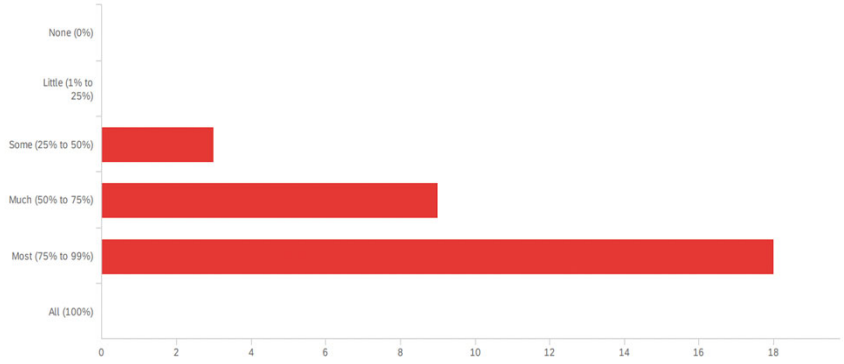
Eating of Food Prepared for In-Home Consumption



Question: Consider the last 7 days. Of the food that your household prepared for in-home consumption, how much of that food did your household eat on avg day?

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Management of Uneaten Food

Action	Mean (%)
Store as leftovers or transform for future eating and then store, which includes refrigerator, freezing, and other techniques.	60.7
Dispose in sink	5.0
Dispose in garbage	23.6
Feed to pets or other animals	4.0
Donate or give to other people	2.6
Compost	4.0

Question: What did you do with the uneaten food?

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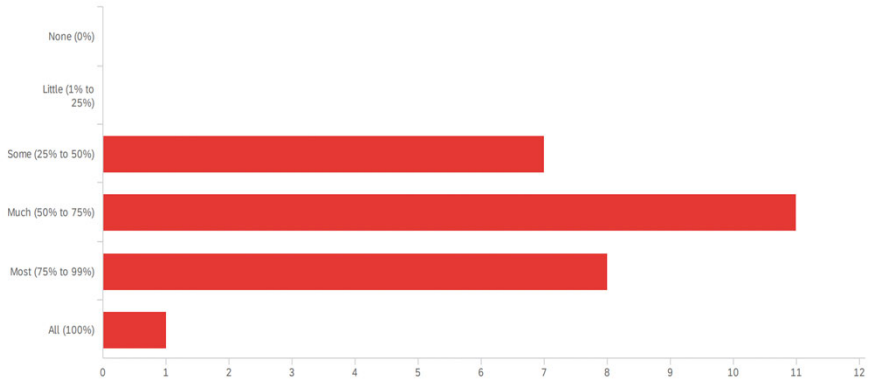
Eating of Perishable Goods



Question: Consider the perishable goods that your household purchased last week, i.e., 8 to 14 days ago. Of these goods, how much did your household eat? Include any perishable goods that your household prepared for consumption.

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Management of Uneaten Perishables

Action	Mean (%)
Store as leftovers or transform for future eating and then store, which includes refrigerator, freezing, and other techniques.	36.2
Dispose in sink	2.7
Dispose in garbage	40.6
Feed to pets or other animals	3.9
Donate or give to other people	4.0
Compost	12.7

Question: What did your household do with the uneaten perishable goods?

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Management of Uneaten Shelf-Stable Goods

Action	Mean (%)
Retain for future use	67.8
Dispose in sink	2.0
Dispose in garbage	12.0
Feed to pets or other animals	2.2
Donate or give to other people	14.4
Compost	1.6

Question: What did your household do with the uneaten shelf-stable goods purchased in the past six months?

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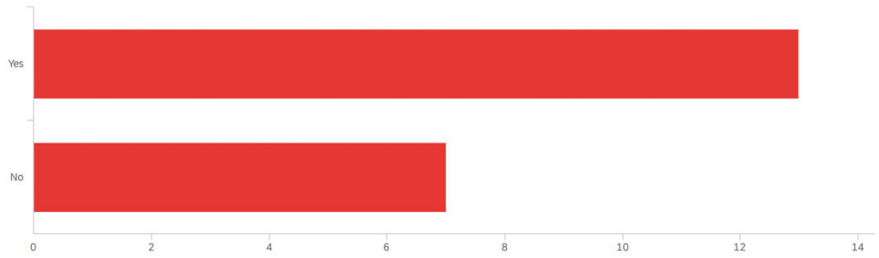
Eating of Others' Uneaten Food



Question: Over the past 7 days, did you ever eat the food that others in your household started to eat but never finished?

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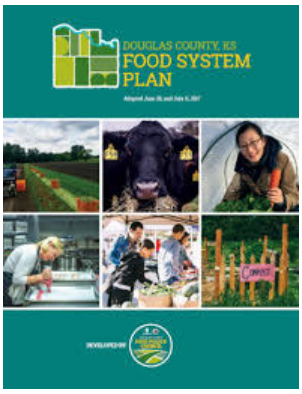
6. In-Home Food Management

- Intervention
  - » Food Policy Council
  - » Food System Plan
  - » Goal: reduce food waste
  - » Survey book ends
    - baseline
    - follow-up



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