Plate Waste of Southern California Hospitals: A Comparative Study

Brienna Eaton, Ryan Giffen, PhD, Dustin Moore, MS, RDN, Denise Torok, MS, RDN.

Department of Family & Consumer Sciences

College of Health & Human Services, California State University Long Beach

Introduction

Why Does Food Waste Matter?

- Annually, the US disposes of an average 133 billion pounds of related food waste, and the United States Department of Agriculture, USDA, reports that over one-third of fresh produce is thrown away
- The global healthcare system contributes 4.4% of total greenhouse gas emissions, with a portion of those emissions coming from landfills where food is sent
- Since the healthcare system contributes a significant amount of food waste, decreasing food waste represents an opportunity for cost savings in the hospital food service budget subsequently, helping our nation reach the 2030 goal of reducing food waste by 50%

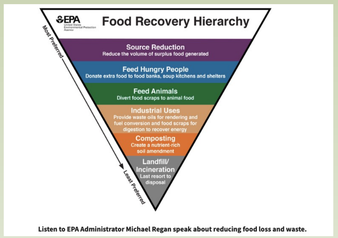

Figure 1. *Hierarchy of food waste. The Environmental Protection Agency (EPA) show the most preferred to least preferred food allocation methods for sustainability.*

Methods

- This study quantified food waste between two Southern CA Hospitals, comparing waste produced by different food service systems using variation-finding comparative design

Selection of the Sample

- Study Design: Variation-Finding Comparative Design
  - Averages of food waste were compared to examine the difference in waste yield between the two hospitals
- Sampling Technique: Stratified Sampling
  - The strata were the carts carrying food trays from different wards/wings
  - The goal was around 10 trays per cart
- Exclusion Criteria: Liquid diet orders, trays missing a significant amount of the meal indicating the waste was tossed elsewhere, trays from non-observed meals on the cart, and trays from long term wards (i.e., rehabilitation units)

Procedure

- Verbal permission for access to foodservice areas and carts was obtained from both Hospitals
- After meal service, trays from each ward/wing were examined for plate waste before entering the dish room for Breakfast and Lunch for 3 days
- Each tray was examined by percentage (0, 25, 50, 75, 100) closest to
- Data was then written in a chart separated by percentages of meal consumed

Results

Hypotheses Investigated

- **H_1:** There will be no significant difference between plate waste from breakfast and the hospital food service system.
- **H_2:** There will be no significant difference between the amount of plate waste from lunch and the hospital food service system.
- **H_3:** There will be no significant difference between overall plate waste and the hospital food service system.

Plate Waste Data Collected

- The sample consisted of a total of 1,274 plates from both hospitals including 629 breakfast trays and 645 lunch trays.
- At Hospital A in total 641 trays were collected; 314 breakfast trays and 327 lunch trays
- At Hospital B in total 633 trays were collected; 315 breakfast trays and 318 lunch trays

T-test of Equal Variance

- The results of all *t*-tests ran for each hypothesis cannot conclude a significant difference between Hospital A and Hospital B's food service systems on plate waste.

	Hospital A		Hospital B		*t* stat	*df*	one-tailed *p*
	M	*SD*	*M*	*SD*			
Total	69.189	34.12	68.009	33.04	.612	1272	.270
Breakfast	71.099	35.62	69.921	31.69	.428	627	.334
Lunch	67.355	32.57	66.116	34.28	.460	643	.323

Figure 2. *Results of percent meal consumed and t-test from Hospital A's and Hospital B's foodservice system*

Discussion

Findings

- The average percent wasted was consistent with reports of 30% plate waste in a review of 32 different hospitals globally
- Studies that investigated waste generated by different foodservice systems did not support the findings that the difference in plate waste was not significant between Hospital A and Hospital B
- Lunch had more plate waste than breakfast for most (5/6) days which is supported by the literature
- Explanations for why plate waste was higher in Hospital B: the traditional inclusion of mealtimes and different wards

Limitations

- Sample Size: this study only investigated two hospitals for 2 meals over the course of 3 days
- This study does not investigate directly why a patient may not eat their food resulting in plate waste
- Plate waste was not separated by groups (i.e., food groups wasted more, which ward produced more waste)
- The study design was only observational and omitted any intervention that could have decreased food waste in hospitals

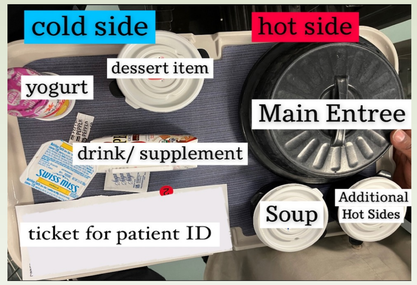

Figure 3. *Example of a patient tray at Hospital A. The bulk-chill food service system allows for minimal substitutions, so trays mostly look the same for all patients served with minor replacements relative to diet order.*

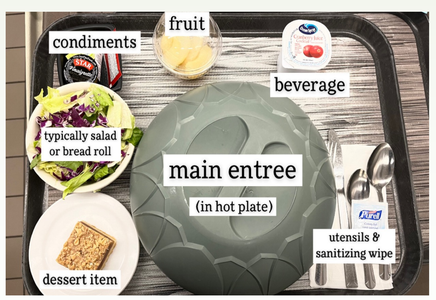

Figure 4. *Example of a patient tray at Hospital B. The modified room service style food service system does allow for substitutions and meal ordering, so not all trays look the same.*

Conclusion

- This comparative study shows that merely changing a food service system in clinical settings is not enough to reduce waste
- Many institutions are generally unaware of how much food waste is produced and what are the associated costs due to the lack of tracking food waste which prevents waste reduction measures from being implemented
- Zero waste is not realistic, but a goal percentage (i.e., 10-20%) wastage should be developed for acceptable plate waste

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For more information

Please contact *brienna.eaton@csulb.edu for additional inquiries*. More information on this and related projects can be obtained at *https://www.csulb.edu/college-of-health-human-services/family-and-consumer-sciences/ms-program-nutritional-science-5.*

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