

Oregon Wasted Food Study: Institutional and Commercial Sector Case Studies

Case 6 Best practices in a small restaurant

This report was prepared for
Oregon Department of Environmental Quality, Ashley Zanolli, Project Lead

Submitted
November 20, 2018

By

Reed Brodersen, MURP
Graduate Research Assistant

Christa McDermott, PhD
Director

Jennifer Stefanick
Research Assistant

Community Environmental Services

Portland State University
P.O. Box 751
Portland, OR 97207-0751

1600 SW 4th Avenue, Suite 128
Portland, OR 97201
503-725-5949
christa@pdx.edu

Table of Contents

Introduction..... 5
Focus of study 5
Business context..... 5

Methods 5
Study design 5
Interviews..... 5
Waste assessments 6
Practices that support full food utilization..... 6

Results 6
Waste sorts 6
Interviews..... 6
Sources of wasted food..... 6
Existing prevention strategies 7

Analysis and Conclusion..... 8
Key causes and barriers to prevention 8
Featured best practices..... 8
Full utilization and repurposing of product 8
Culture of waste prevention..... 8
Skilled staff with low turnover..... 9
Buying soon-to-spoil produce: a mixed result..... 9
Conclusion and additional opportunities 9

Appendix: Waste sort process and data 11
Waste collection and sorting process 11
Waste assessment results 12
Sort photographs 13
Conformance to Food Loss and Waste Reporting Standard 15

Index of Tables and Figures

Table A1: Waste sort categories and definitions.....	11
Table A2: Waste assessment results from back-of-house and front-of-house waste.	12
Figure A1: Edible prepared food, entirely made up of expired tamales, from the back-of-house waste sort	13
Figure A2: Inedible food waste from the back-of-house waste sort	13
Figure A3: Edible baked waste from the back-of-house waste sort	14
Figure A4: Spoiled vegetables and fruit, with pre-tare weight, from the back-of-house waste sort.....	14
Figure A5: Scope of Case Study 6 as it relates to the Food Loss and Waste Reporting Standard	15

Introduction

This is a report on the methods and results of one of 15 food service business case studies, as part of the institutional and commercial (IC) sector portion of the Oregon Wasted Food Study. This study is funded by the Oregon Department of Environmental Quality and conducted by Community Environmental Services (CES) at Portland State University.

The research objectives for the IC portion of this study are to:

- Understand components of wasted food in IC sector
- Highlight causes of commercial wasted food and key opportunities for waste prevention
- Test wasted food reduction best practices and quantify their effectiveness
- Promote wasted food reduction best practices for application at commercial food service institutions

Focus of study

This study explores the major types and causes of wasted food in a small food service business that includes a wholesale production kitchen, grocery and deli. In assessing their waste, it was apparent that this business excels in fully utilizing food and has several best practices to share with other organizations.

Business context

The participating business is a small, independently owned and operated food service business that produces tortillas, tamales, salsas and other products for wholesale, has a cafeteria style restaurant, and a small grocery operation.

Methods

Study design

The study was conducted over a four-month period from August 2017 through November 2017. It included employee interviews, on-site observations and a waste sort. The intent of these analyses was to (1) identify types of wasted food and key causes of waste, and (2) document successful source reduction best practices.

Interviews

A total of seven employees were interviewed for this study. These included the business owner, two buffet chefs, two tamale chefs, and two prep chef/cashiers. The interview with the owner took place in August 2017, while the remaining Interviews were all conducted on the same day in October 2017. Five of the seven interviews were conducted with the assistance of an interpreter, who translated questions to interviewees and answers back to the interviewer.

Employees voluntarily participated in one-on-one interviews, on site but in a private location. Interviews were recorded and took between 15 and 25 minutes, except the interview with the business owner which was 60 minutes. The interviews were semi-structured: standard interview questions were asked of each

employee with additional questions asked that either responded to employee answers or pertained to their specific role.

Waste assessments

Waste was assessed with two waste sorts. Researchers sorted the business' entire front-of-house and back-of-house food scrap waste generated during a 24-hour period of regular business in November 2017. Food scrap waste was retrieved from a 4-yard dumpster adjacent to the business for the sort. No post-intervention sort was conducted for this case study. The sorting process was standard to other sorts conducted by researchers, detailed in the appendix of this report.

Practices that support full food utilization

Highlighted below are several best practices identified in the course of this study: **repurposing ingredients, food utilization as an organizational value, and maintaining a skilled staff with minimal turnover.** While food was mostly well utilized, there were some opportunities to further reduce wasted food, primarily in the front of the house where it was noted that customers threw a sizable amount of tortillas away. Researchers suggested a portion control strategy, making the default number of tortillas one instead of two per taco or asking customers if they would like one or two tortillas. However, the owner expressed concerns about both options because of cultural appropriateness. She said that asking some of Hispanic heritage whether or not they wanted two tortillas with their taco would be “like asking someone if they want a fork.” Other potential strategies, like instituting a digital inventory management system, were not feasible because of limited financial and staff capacity.

Results

Waste assessments

Back-of-house waste was sorted and weighed a total of 56.47 pounds for a 24-hour period. **Inedible parts** of food (19.51 pounds, 21.8% of total wasted food) were the largest overall waste category including cornhusks, onion, pepper and tomato trim, chicken bones and lime peels. However, **prepared foods**, primarily outdated tamales, were the top wasted *edible* food group (19.4 pounds, 52.5% of wasted edible food). **Fruits and vegetables** were the second highest area of wasted food (10.04 pounds, 27.2% of wasted edible food) consisting of spoiled tomatoes, jalapenos and garlic bulbs.

Front-of-house wasted food was sorted and weighed a total of 14.8 pounds for a 24-hour period. Of this, 90.6% (13.4 pounds) was edible wasted food. Here, too, prepared foods were the top wasted edible food group (11.98 pounds, 80.9% of total waste, 89.3% of wasted edible food) and largely consisted of tacos, burritos, tamales, Spanish rice and other plate scraps.

Interviews

Sources of wasted food

Employees identified three sources of wasted food: **spoilage, catering events and customer plate waste.** Staff noted that spoilage was infrequent, but it did happen. This was, in part, because they primarily ordered

“tired” (soon-to-spoil) produce from a wholesaler. **The owner identified catering events as a particularly significant source of wasted food.** They would serve at community events with unknown attendance and sometimes bring too much to sell. The remaining would generally be donated, but is still considered an opportunity for source reduction. **Smaller, private catering events were less likely to have leftovers and leftovers were generally taken home by attendees.**

Front-of-house employees said that although most customers took food to go, they often saw customers who ate in leave some food on their plate. Almost 12 pounds of edible prepared food was found in the front-of-house waste sort, confirming that **front-of-house wasted food is a problem.** Discussing the issue with the owner, researchers learned that there are cultural barriers to reducing plate waste. For example, when it was suggested to switch the default serving from two tortillas per taco to one, she said “to Mexican people, that would be like asking them to eat without a fork.” Though there is evidence that this is not a universal norm across Mexico, it is clearly understood as a norm for her customers, and she believed that a change could harm her relationships with long-time customers.

Existing prevention strategies

The most commonly cited prevention strategy by employees was that the business had a **culture of waste prevention.** While the owner expressed her role in **setting strong expectations for full utilization and thrift,** many employees also drew from their own cultural backgrounds, informing their professional and personal behaviors. One employee said, “this is what I do at my house. In my life. It is what my mother taught me.” Another said, **“I feel bad when I see clients leave food on their plate. Where I’m from there’s not much food to be wasted. I think there’s a different cultural value placed on food.”** Though most employees expressed similar beliefs, a few acknowledged that not everyone at the business held them as strongly.

Another critical strategy for source reduction was strong practices of **full utilization and repurposing of product.** Even vegetables that are going bad will be trimmed, removing bad spots while using the rest of the item. Products are also used to their fullest; tomato and pepper stems are used in the production of sauces and stocks. These practices are also supported by a **versatile menu that relies on many overlapping ingredients.** Leftover ingredients from one menu item, or even the menu item itself, could often be repurposed into another item. Other examples of these practices include the reutilization of lettuce and cactus trimmings to make lettuce and cactus salsas. Meats that do not sell from the deli are turned into gorditas (pastries stuffed with meats, cheeses or vegetables).

The business also deployed **cross utilization across business components** to maximize the use of ingredients and products. For example, soon-to-expire or soon-to-spoil grocery products, especially produce, are used in the deli. **“My girls are always out in the grocery aisles seeing what needs to be used up,”** the owner said. Tamales made for wholesale are sold in the deli if the order gets changed or extra are made. Fresh tamales at the deli that do not sell are frozen and sold in bulk. **Extra meats, sauces, etc. from the wholesale kitchen are also used to make deli menu items.** Finally, **unserved catering food is either sold at the deli the next day or repurposed into another dish.** The waste sort supported these claims that re-utilization was effective at minimizing wasted food. Relatively little prepared food from the deli was found (less than four pounds), and a majority of the prepared food found was expired tamales, which, according to the owner “was not normal” and “she had someone to talk to about it.” Apparently, a staff member was routinely forgetting to use overproduced tamales from one day’s production on the next day, and had accumulated a stack of a dozen or so in the fridge over a period of about a week before realizing it and throwing them out.

The business reduces overproduction waste by only **producing to order**. Wholesale orders are made the day before delivery, with the goal being to make only what was ordered. To ensure all of the tamale meat gets used, **staff will sometimes make extra tamales but tag them to be used for the next day's orders**. The deli also tries to reduce overproduction waste by **cooking in small batches** throughout the day, and **ramping down production at the end of the day**.

These practices and more benefit from the many long-time staff who have been with the business for 10, 15 or 20 years. **The uncharacteristically low turnover supports the maintenance of well-trained staff and helps maintain the aforementioned culture of thrift and waste prevention**. Employees said they have stayed on so long because it was good work and they felt like family. The owner said she treats her staff like friends and family, treating everyone to yearly, all-staff vacations with everyone's families.

Analysis and Conclusion

Key causes and barriers to prevention

While this business has a high level of food utilization, two areas of improvement were identified. **A lack of formal tracking processes** allowed one employee's error in forgetting to shift leftover product out of the refrigerator to the freezer, which resulted in the bulk of the waste identified. This may have resulted from a lack of communication between employees or could have been the fault of a single employee placing overproduced tamales where others were unaware of them. **A method of tracking or daily review of leftovers** could have prevented this.

An issue of norms is also contributing to front-of-house wasting of food. Tortillas were notable in the front-of-house waste sort, and their waste appeared tied to the norm of serving two tortillas with a taco. Changing to serving one tortilla as a default and asking if a customer wanted two tortillas could reduce this waste. The norm of two tortillas is, however, perceived as very strong and difficult to change.

Featured best practices

Full utilization and repurposing of product

The waste sort confirmed what employees noted - very little food was wasted by poor trimming. A standard practice at this business is to cut out bad or inedible parts and to trim closely, to **use as much of an ingredient as possible while maintaining high quality standards**. Also, it is routine practice to **repurpose foods by selling them in other parts of the business**, e.g., overproduction in catering is sold in the deli.

Culture of waste prevention

Staff interviews highlighted a range of ways in which **individual and institutional values of food waste prevention drove prevention behaviors and policies**. The owner expected tamales to be made only as they were ordered, and purchased soon-to-expire produce knowing it could go to waste elsewhere, would cost her less and did not reduce the quality of her product. Repurposing is built into menu offerings like and gorditas or salsa made from surplus lettuce and hot peppers. Employees crafted deli menu items out of those

which have not sold. Almost daily cooks scour the grocery for soon-to-expire products and produce to make sure it does not go to waste. While the owner surely impresses her values of wasted food prevention on others, many staff said they had never been instructed by the owner to do anything differently than what they naturally do - these practices, they say, come from their upbringing in Mexico, and **it's what they do at home.**

Skilled staff with low turnover

A clear key to the full food utilization success is the staff at this business. Compared to the food service sector more broadly, staff are employed for exceptionally long terms, resulting in **highly skilled employees, expert in their work.** The **staff culture of collaboration** also means that staff communicate well and have learned to work together over their long period of service in the business.

Buying soon-to-spoil produce: a mixed result

An interesting finding was that this business did have a high spoilage rate, with spoiled produce as a percentage of the total purchased coming in at, 7.46%. This was based on the identification of 8.52 pounds of spoiled tomatoes and jalapenos (which made up the largest portion of the approximately 10 pounds of edible fruit and vegetable waste found in the sort). This 8.52 pounds was produced in the business day assessed, which when extrapolated to a weekly amount totals 59.64 pounds, out of the average of 800 pounds of tomatoes and jalapenos purchased per week. **This business helps to reduce the wasting of food in the larger food system by buying a large amount of soon-to-spoil produce. However, it does result in spoilage on site.**

Conclusion and additional opportunities

This case study suggests that **food waste prevention can be done robustly and effectively when it is embedded in the culture of an institution and its employees, and is reflected in its procedures.** In this study, researchers document the effective re-utilization and cross utilization of food product between business components, working to minimize wasted food and promote source reduction.

This business shows that **source reduction does not require sophisticated software or processes.** This business operated with a decades-old POS system, and had no formal ordering or inventory system besides the owner's memory. Rather, **the business relied on an owner and employees who - informed by their personal, cultural and lived experiences - did not find food waste acceptable.** This strong organizational culture that did not approve of waste provides an excellent foundation for deploying strategies to prevent the wasting of food. **This foundation could be even stronger with the addition of a minimal amount of formal tracking,** to catch errors and provide institutional coherence, should key team members retire, take time off, etc.

How do businesses build a culture of wasted food prevention? In some ways, this case study demonstrates that it is not just the institutional culture that is important, but the lived experiences of individual workers and how these experiences shape their social and cultural relationship with food. **Businesses can include questions about a potential employee's perspectives on wasted food and emphasize the norm of fully using all food and preventing waste in the job description in their recruiting processes.**

While its existing performance is impressive, this business could improve its food utilization with a few additional strategies. To reduce front-of-house and catering waste, it could deploy **customer-facing practices such as more portion size choices, or changing the default size served.** For example, could

reduce the number of tortillas per taco from two to one and encourage customers to ask if they'd like additional tortillas. **In catering, they could prepare ingredients so they could be used in the restaurant and repurpose leftover unserved items.**

This business benefits from a few somewhat unique factors. First, **the owner/operator model, as opposed to a multi-site corporate model, allows the owner to have more control over her business, employees and their practices.** Beyond control, though, the owner appears to have developed **strong relationships with most of her staff members, which appears to both influence their behavior and endear them to the organization.** Second, the **business benefits from a variety of food service venues** (the wholesale kitchen, the cafeteria, and the grocery), which it intentionally exploits to cross-utilize ingredients and leftover menu items.

Appendix: Waste sort process and data

Waste collection and sorting process

One folding table was set up with two flat black bins placed on table and two CES staff conducting the sort. Bags from a 24-hour sample of mixed waste were dumped into black bins to facilitate sorting through contents. Numerous five-gallon buckets were placed around and under the tables and labeled with each specific food category for sorters to toss each item. Foods were sorted according to back-of-house or front-of-house, if applicable. Once all foods were sorted and categorized, photos were taken of the contents of each bucket. All buckets were weighed with amounts recorded with a tare weight of each bucket, once empty, also weighed and recorded. Non-food materials for landfill and recycling were also separated during the sorting process, weighed and recorded.

Table A1: Waste sort categories and definitions

Categories		Definitions	Examples
1	Inedible	Items not intended for human consumption (small amounts of edible material associated with the inedible material are permitted to be included)	Egg shells, banana peels, pits/seeds, bones
2	Meat & Fish	Uncooked or cooked meat (with mostly edible components) unmixed with other types of food	Chicken drumstick, salmon fillet
3	Dairy	Solid dairy products unmixed with other food types or in original form	Cheese, yogurt
4	Eggs	Egg products unmixed with other food types or in original form	Fried egg, whole eggs, liquid egg whites
5	Fruits & Vegetables	Solid uncooked or cooked vegetables and fruits (with mostly edible components) unmixed with other types of food	Potatoes, spinach, berries, salad with only vegetables
6	Baked Goods	Baked goods and bread-like products unmixed with other food types or in original form, including pastries	Bread, tortillas, pastries
7	Dry Foods	Cooked or uncooked grains, pastas, legumes, nuts, or cereals unmixed with other food types or in original form	Rice, cereal, pasta
8	Snacks, Condiments, Sauces	Includes confections, processed snacks, condiments, and other miscellaneous items	Condiments, candy, granola bars, sauces, jellies
9	Liquids, Oils, Grease	Items that are liquid, including beverages	Sodas, milk, oil, juice
10	Cooked or Prepared Food	Items that have many food types mixed together as part of cooking or preparation	Lasagna, sandwiches, burritos
11	Unidentifiable	Used only if necessary	

Edited and used with permission of NRDC (Hoover, 2017)

Waste assessment results

Table A2: Waste assessment results from back-of-house and front-of-house waste

	Back-of-house weight (lb)	Front-of-house weight (lb)	Total
Landfill (non food)	30.17	15.75	45.92
Comingled Recycling	2.98	2.14	5.12
Inedible	19.51	1.39	20.9
Meat & Fish	0.23	0.53	0.76
Dairy	<.01	<.01	<.01
Vegetables & Fruits	10.04	0.27	10.31
Baked Goods	4.82	<.01	4.82
Dry Foods (Grains, Pasta, Cereals)	<.01	<.01	<.01
Snacks, Condiments, Sauces	0.49	0.63	1.12
Liquids, Oils, Grease	1.98	<.01	1.98
Cooked, Prepared, Leftovers	19.4	11.98	31.38
Unidentifiable	<.01	<.01	<.01
Edible wasted food (lb)	36.96	13.41	50.37
Edible wasted food (% of total food)	65.45%	90.61%	70.67%
Total food scrap waste (lb)	56.47	14.8	71.27
Total food scrap waste (% of total waste)	63.01%	45.27%	58.27%
Total Waste	89.62	32.69	122.31

Sort photographs



Figure A1: Edible prepared food, entirely made up of expired tamales, from the back-of-house waste sort



Figure A2: Inedible food waste from the back-of-house waste sort



Figure A3: Edible baked waste from the back-of-house waste sort



Figure A4: Spoiled vegetables and fruit, with pre-tare weight, from the back-of-house waste sort

Conformance to Food Loss and Waste Reporting Standard

[The Food Loss & Waste Protocol](#)¹ is a multi-stakeholder partnership, which has developed the global Food Loss and Waste Accounting and Reporting Standard – also known simply as the FLW Standard. Launched in 2013, the Food Loss & Waste Protocol’s mission is to ensure wide adoption of the FLW Standard so companies, governments, cities and others are better informed about food loss and waste and motivated to curb this inefficiency.”

The graphic below describes the scope of Case Study 6 of the institutional and commercial sector assessment of the Oregon Wasted Food Study using the FLW Standard.

Food loss + waste protocol

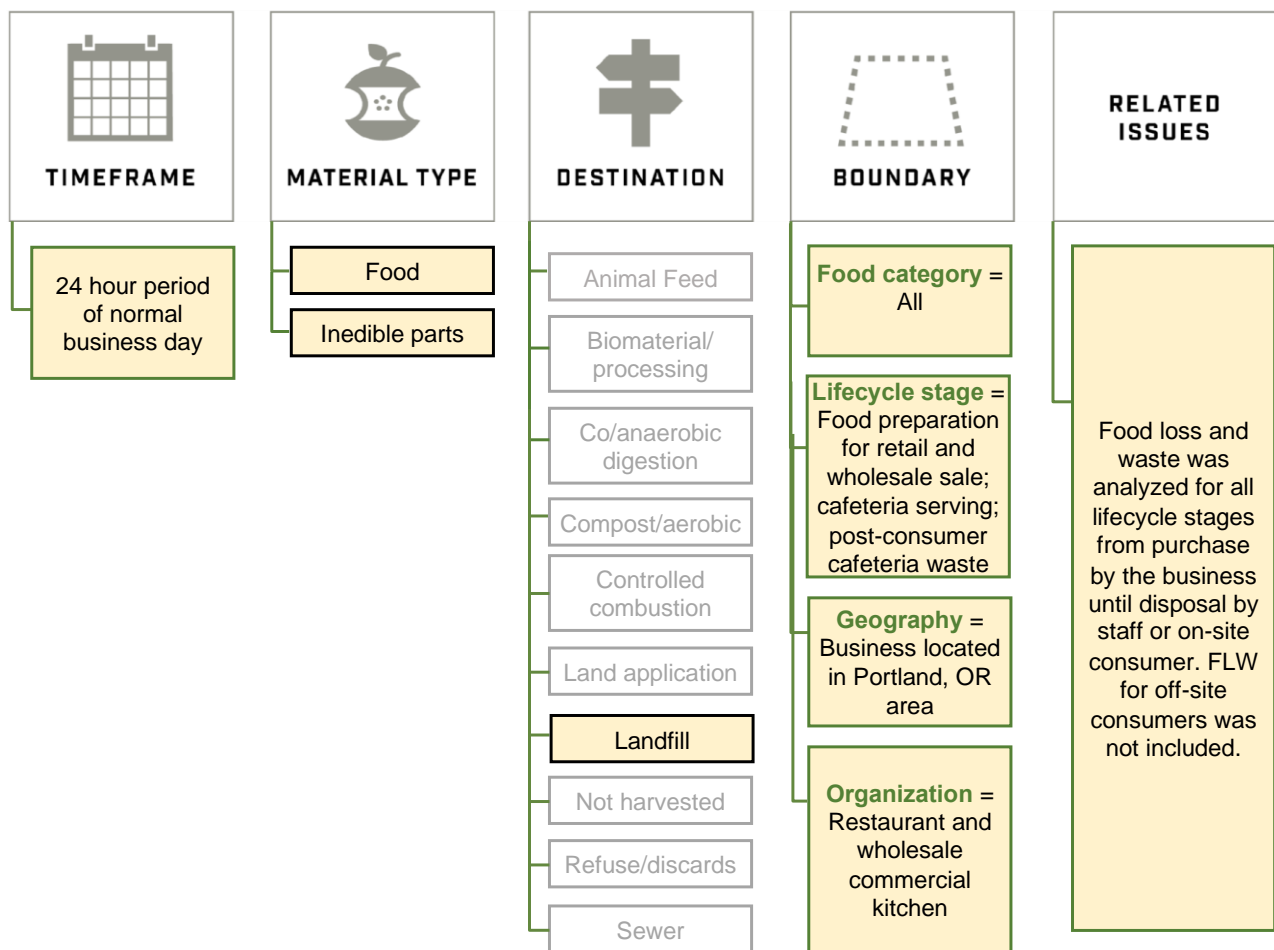


Figure A5: Scope of Case Study 6 as it relates to the Food Loss and Waste Reporting Standard

¹ See, <http://flwprotocol.org>