

Food Service Training to Create Sustainable and Food Secure School Food Systems.

Abstract:

1. Introduction. Food waste is a major issue in the United States. The United States Department of Agriculture (USDA) estimates that 30-40% of the food produced in the United States is wasted. In 2010, the USDA estimated that there was 133 billion pounds and \$161 billion worth of food waste in the United States (NRDC, 2017). In addition to the economic cost of food waste, food waste also has a serious environmental cost. The resources used to produce food such as land, water and transport are not often factored into the cost of food waste (NRDC, 2017). Moreover, food waste is one of the leading emitters of methane in the world (NRDC, 2017). Methane is a greenhouse gas more potent than carbon dioxide. The dangers in food waste are both environmental and economic and the federal government has started working on tackling this issue (NRDC, 2017). In 2015, the USDA created a Food Waste Challenge jointly with the Environmental Protection Agency (EPA) in hopes to make an impact on food waste nationally. This Food Waste Challenge intends to bring to light the issue of food waste and start working on improving agricultural, manufacturer and consumer behaviors to reduce food waste. Large food service operations can be leveraged to improve food waste nationally. The Food Waste Challenge targets schools as a priority sector to reduce food waste due to their scale, with special emphasis on schools who receive funding from USDA through the National Lunch Program. Many of the studies on food waste in schools have assessed the amount of food waste in a particular school with food waste ranging from 26% (Byker et al., 2014) to 45% (Spiker et al., 2017) of food served. The National School Lunch Program provides free and reduced meals to over 3 million low-income children a day (Cohen et al., 2014). Additionally, studies on food service training have assessed the impact of the training on implementation of strategies but not on student behaviors. (Bean, 2019) The objective of this study is to assess the effectiveness of a food service training program on food waste in a Northeastern, low-income school district.

2. Methods.

The district is located in a midsize city in northern New Jersey. The district serves 25,010 students from very diverse backgrounds.

The school district used for this intervention has a total of 46 schools, of which 30 were elementary and middle schools that prepare their meals on site and thus met the study inclusion criteria. A random sample of 15 schools were selected of the 30 eligible schools to participate in the study. The schools selected varied in total enrollment, with enrollment ranging from 138 students to 857 students.

Baseline food waste data were collected at two time points in each school in the month prior to the intervention training (from February 2017 until March 2017). Post-intervention food waste was measured at two time points in each school approximately four weeks after the training, in April 2017.

This training introduced the issue of food waste in America, provided a snapshot of food waste observed in the schools (as collected during a pre-intervention baseline assessment) and described the Smarter Lunchrooms Movement techniques that can be employed to reduce food waste in schools. The Smarter Lunchroom Movements training was based on behavioral economics “nudges” to improve the cafeteria environment which led to reduced food waste. The training included best practices to implementing low-cost or no-cost changes to the lunchroom. Changes included, offering multiple fruits and vegetables, retraining on the requirements of a reimbursable meal, providing condiments with the meal, and promoting taste testing of new foods.

3. Results.

Of the food and beverages served during our 60 visits to schools 2,473 pounds were wasted before the intervention and 2,123 were wasted after the intervention. Overall, 350 pounds of food was saved which was a 14 % reduction in food waste due to this intervention. That is approximately 12 pounds of waste saved per school per day and a total of 90,720 pounds of food waste saved for the whole district for the year. The estimated savings of food cost for the 90,620 pounds of food is \$76,452. Overall, the intervention showed the impact of a food service training program on reducing food waste. See food waste changes in table 1.

Table 1: Data Collection from Food Waste Study		
	Baseline Food Waste	Food Waste Post Intervention
	<p>530 pounds of waste (Fruits) 570 pounds of waste (Vegetables) 902 pounds of waste (Dairy) 471 pounds of waste (Grains) 471 pounds of waste (Protein)</p>	<p>380 pounds of waste (Fruits) 490 pounds of waste (Vegetables) 804 pounds of waste (Dairy) 449 pounds of waste (Grains) 449 pounds of waste (Protein)</p>
Total	2,471 pounds	2,125 pounds
	Total Saved	346 pounds

According to the data the food components with the most significant food waste reduction were the fruit, vegetable and milk components. See table 2 for a description of the food components baseline and post-intervention measurements.

Table 2: Food Waste Per Food Component								
Food Component	Mean Baseline Measures Day 1	Baseline Measures Day 2	Average Baseline Measures	Post-Intervention Day 1	Post-Intervention Day 2	Average Post-Intervention	Pearson's R	p-value
Fruit	3.49 oz ±2.042	2.85 oz ± 2.258	3.15 oz ± 2.182	2.12 oz ± 2.132	2.30 oz ± 2.149	2.21 oz ± 2.143	-0.212	0.000
Vegetable	2.60oz± 1.447	2.64 oz ± 1.664	2.62 oz ± 1.560	1.90 oz ± 1.602	1.87 oz ± 1.391	1.88 oz ± 1.498	-0.233	0.000
Grain+ Protein	1.23oz ±1.532	2.02 oz ± 2.203	1.64 oz ± 1.946	1.55 oz ± 1.820	1.59 oz ± 1.860	1.57 oz ± 1.840	-0.018	0.089

Milk	4.55 oz ±3.739	4.03 oz ± 3.713	4.26 oz ± 3.733	3.90 oz ± 3.782	3.82 oz ± 3.745	3.86 oz ± 3.763	-0.054	0.000
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4. Discussion and Conclusions.

Overall, the intervention showed the impact of a food service training program on reducing food waste. The effect of the training was most significant for fruit, vegetable, and milk waste. One of the limitations was that the study only measured plate/tray waste and did not include production waste. Additionally, trainings on food waste should be expanded to different school audiences including but not limited to administrators, teachers, and students.

5. References.

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