

WORLD WILDLIFE FUND "BE A FOOD WASTE WARRIOR" PROJECT SUMMARY

Report by Hamilton County Recycling and Solid Waste District



In early 2019, Hamilton County Recycling and Solid Waste District (District) partnered with three Hamilton County schools to implement the "Be a Food Waste Warrior" curriculum from World Wildlife Fund (WWF). The District's desired outcomes of the project include behavioral change among students to reduce wasted food and to share their experiences beyond the classroom. This project was supported by WWF and the Kroger Co Foundation (Kroger).

Hamilton County Recycling and Solid Waste District
250 William Howard Taft Rd. Cincinnati, OH 45219
513-946-7766

PROJECT OVERVIEW

In early 2019, Hamilton County Recycling and Solid Waste District (District) partnered with three Hamilton County schools to implement the “Be a Food Waste Warrior” curriculum from World Wildlife Fund (WWF). The District’s desired outcomes of the project include behavioral change among students to reduce wasted food and to share their experiences beyond the classroom. This project was supported by WWF and the Kroger Co Foundation (Kroger).

Curriculum

“Be a Food Waste Warrior” produced by WWF is used alongside cafeteria food waste audits. Students learned about environmental impacts of wasted food, conducted food waste audits at lunch, analyzed audit results, and developed action plans to combat wasted food in their community.

Audit Methods

Students from each school served as “Food Waste Warriors” in their lunchrooms and conducted the audits as described in the “Be a Food Waste Warrior” curriculum. Waste was sorted into five categories; milk, other liquid, fruits and vegetables, other food, and unopened/shareable food (Figure 1). Nonedible food scraps, such as chicken bones or apple cores, were included with edible food waste in their respective categories. At one of the schools, food waste from packed lunches was also collected and then weighed separately.

Student Food Waste Warriors were divided into:

- “Sorters” sorted wasted food into the appropriate buckets.
- “Interviewers” surveyed students to learn about why they hadn’t eaten all their food (Figure 2).



Figure 1 Waste Sorting Station



Figure 2 Interviewing Students to Learn about Uneaten Food

DATA ANALYSIS

Fruits and Vegetables

Fruit and vegetable waste was prevalent in nearly every audit. Mixed fruit was offered at all three schools each week and was a common source of waste. Fresh fruit waste varied widely depending on what was offered (Figure 3).

Bite-sized fresh fruits, such as pineapple and grapes, produced much less waste than whole fruits, such as bananas and pears. For example, at School A, when pineapple was served (Audit 2), 7.5 lbs. of fruit and vegetable waste were observed; when bananas were served (Audit 3), 17.9 lbs. of fruit and vegetable waste were collected.

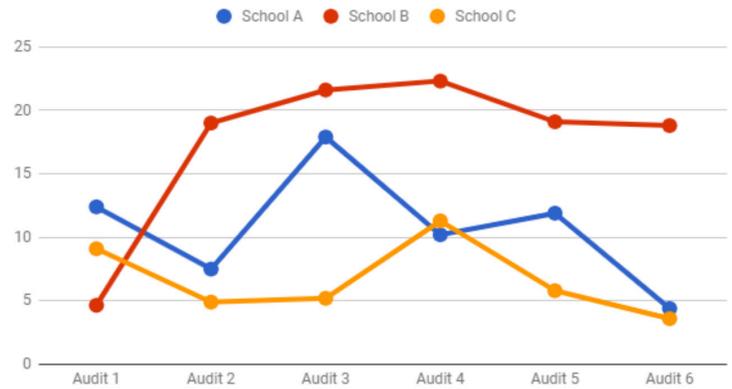


Figure 3 Fruits and Vegetable Waste (lbs.)

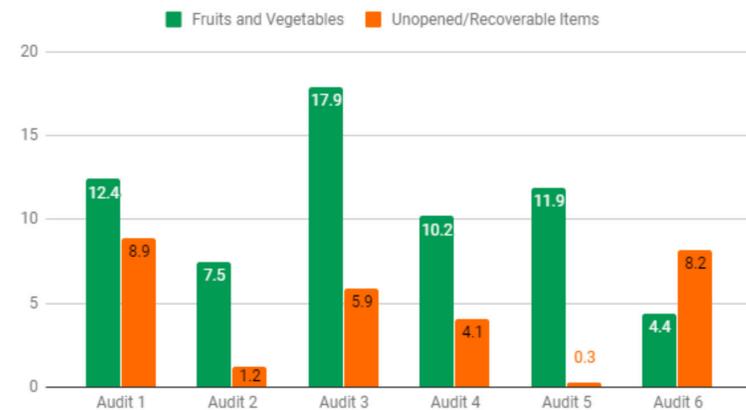


Figure 4 School A "Fruit and Vegetable" Waste vs. "Unopened/Recoverable Items"

Ripeness of the fresh fruit also impacted if it was wasted or not. Throughout the audits, students collected a large amount of unripe bananas, pears, and kiwi. Some fruit was recoverable, thus the weight is observed in the "unopened /recoverable" category (Figure 4).

Commonly observed wasted vegetables included the chef salad and items from the salad bar. The chef salad is served as an alternative meal, and students observed many of these salads

being returned to be thrown out nearly untouched. Because students self-serve salad bar items, some students serve much more than they can eat, leading to wasted food.

Other Food

"Other food," which includes entrees and grains, was another prevalent source of waste. We found that this category varied widely depending on what was served. For example, at School B, bite-sized chicken entrees (Audits 2 and 3) produced significantly less waste than other entrees (Figure 5).

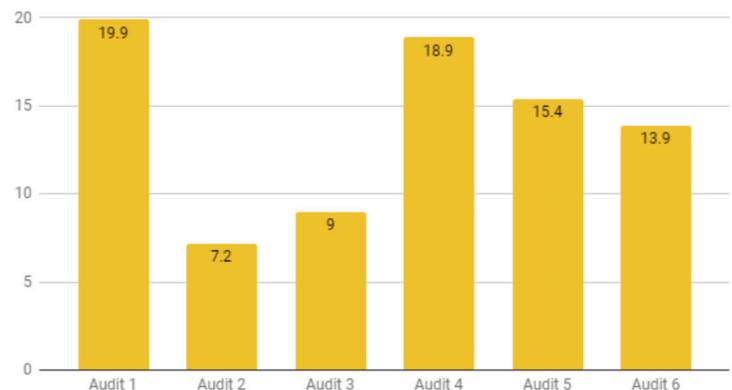


Figure 5 School B "Other Food" Waste

Unopened/Recoverable Food

All schools in the project used a [share table](#) to recover unopened items, which can then be eaten by other students at lunch or donated. Students collected 101.5 lbs. of unopened and recoverable items throughout the audits, more than 15% of total wasted food. This number is likely an underestimate of the total amount of food recovered, since students only measured food left on the share table at the end of each audit. This means that any items taken by students during lunch were not measured.

Milk and Other Liquid

Milk and other liquid waste varied widely between the schools audited (Table 1).

School Name	Fluid Milk Waste (lbs.)	Other Liquid Waste	Student Age Range
School A	62.4	11.5	6-9
School B	57.8	2.3	10-12
School C	17.3	77.2	10-14

Table 1 Liquid Waste by School

There are several possible explanations for this wide discrepancy. First, the average age at School C is higher than at Schools A and B. Younger students are likely to eat and drink less, so that may contribute to the higher waste at Schools A and B.

School C also offers several alternative beverages, including slushies and carbonated juices, while Schools A and B simply offer water. School C students may be less likely to take milk because they plan to choose one of the alternative beverages, leading to lower milk waste. "Other liquid" waste was much higher at School C than at Schools A or B, so overall beverage waste was relatively consistent across the three schools. It is also possible that School C has done a better job educating students that they aren't required to take milk.

Milk and Other Liquid

Interview data provides some insights into why students waste food. Four responses were by far the most common reasons students did not finish their food, making up nearly 90% of responses altogether (Figure 6):

- Too Full
- Didn't Like It
- Not Enough Time To Eat
- Had To Take It

More than 40% of responses show that students were too full to finish their meal. This may indicate that portion sizes are not appropriate for students' hunger level.

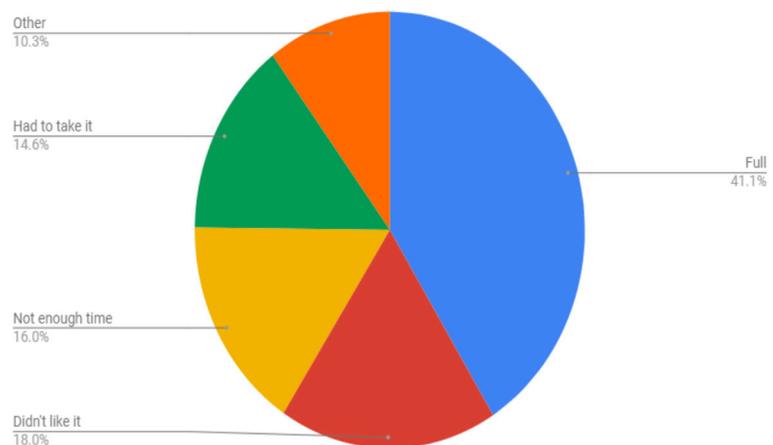


Figure 6 Reasons For Not Eating

Environmental Impacts

Wasting food has impacts far beyond the loss of the food itself. During this project the food wasted produced the following environmental impacts:

- More than 191,000 gallons of water used in production wasted
- Greenhouse gas emissions equivalent to driving 545 miles in a car
- \$978 worth of food wasted

The average food waste throughout the audits was 0.24 lbs. per student each day. If that figure is representative, it would mean that schools in Hamilton County produce more than 12.5 tons of food waste every day.

WASTE REDUCTION STRATEGIES

The following are suggestions to the schools in this study to increase waste reduction of food at their school.

- Serve fresh fruit at peak ripeness
- Cut up fruit into bite-size pieces
- Offer variety¹
- Start composting
- Integrate student feedback on menu
- Provide taste tests²
- Find a “Share Table Champion”
- Develop variety in alternative meals
- Encourage waster as an alternative
- Consider bulk milk

Education

While the strategies above primarily relate to the cafeteria, schools can also highlight the impacts of wasted food in the classroom. The [Food Waste Warrior Toolkit](#) equips teachers with a variety of activities related to food waste, and the [Food Matters Action Kit](#) offers lessons and activities about food systems and waste reduction for all ages. When students understand why wasted food matters, they will be motivated to see all the strategies outlined above succeed.

GET INVOLVED

The District will continue to conduct food waste audits at Hamilton County schools. To schedule audits at your school or discuss waste reduction strategies, contact Cher Mohring at Cher.Mohring@Hamilton-Co.org or 513-946-7737.

¹ Hakim, S. M., & Meissen, G. (2013). *Increasing Consumption of Fruits and Vegetables in the School Cafeteria: The Influence of Active Choice*. *Journal of Health Care for the Poor and Underserved*, 24(2A), 145-157. doi:10.1353/hpu.2013.0109

² Pope, L., Roche, E., Morgan, C. B., & Kolodinsky, J. (2018). *Sampling tomorrow's lunch today: Examining the effect of sampling a vegetable-focused entrée on school lunch participation, a pilot study*. *Preventive Medicine Reports*, 12, 152-157. doi:10.1016/j.pmedr.2018.09.010