EDUCATING TOMORROW'S FOOD WASTE WARRIORS

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Nearly 8 billion people call this planet home. By mid-century, we're projected to add 2 billion more. But feeding all those people comes at a cost. Agriculture uses 70 percent of available fresh water, 33 percent of available land area, and 30 percent of global energy—all while putting enormous pressure on critical ecosystems and the many species they sustain.[1] Yet despite the vast resources that go towards producing food, an estimated 30-40 percent of it is wasted.[2]

In the U.S., approximately 63 million tons of food are lost or wasted each year, while one in seven Americans, including 13.1 million children, live in food insecure households.[3] An estimated 40 percent of food waste in the U.S. occurs in consumer-facing businesses such as retailers, restaurants, hospitality, and institutions like schools. Through the National School Lunch Program (NSLP) and School Breakfast Program (SBP), U.S. schools serve approximately 30 million lunches and 14.6 million breakfasts each day to eligible students, at an annual cost of about $17.8 billion federal dollars.

But how much of that federally-funded food winds up in the trash? School waste has not yet been comprehensively measured, though one study estimated that roughly $1.2 billion of NSLP dollars go to waste[4].

With so much food moving through schools each day, there is a huge opportunity to work with students, teachers, food service providers, cafeteria staff, and more, to inspire change in both institutions and young people. Schools can use their cafeterias as classrooms and start to build a culture of respect for food that can help students understand the connection between what they eat and their planet, and forge lifelong stewardship habits.

We can no longer afford to be inefficient with our natural resources or our food. What we need now is a new generation of food waste warriors.

THE FOOD WASTE WARRIOR CURRICULUM

In 2016, World Wildlife Fund's Food Waste Team teamed up with the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, and Melissa Terry from the University of Arkansas who had already created a detailed instructional **Guide to Conducting Student-Led Food Waste Audits**. Leveraging the guide, the WWF team developed an educational and experiential toolkit for teachers to raise awareness of food waste and its environmental impacts.

In 2017 the **Food Waste Warrior** curriculum was launched as a free resource within WWF's **Wild Classroom** platform. By leveraging student passion for wildlife, the curriculum highlights the impacts of food waste on wildlife habitats across the U.S. and around the world.

Both the structure of the curriculum and the food waste reduction tactics for schools are aligned with WWF's three strategic tenets for reducing food waste anywhere: prevention, donation, and diversion.

In 2017, the team piloted the curriculum in more than a dozen DC schools. WWF helped these schools run their own food waste audits and reduction efforts— and garnered several key insights in the process on related issues and other groups involved in the work. We saw firsthand that school food waste is an intensely complex topic that necessitates strong and diverse partnerships. We also saw that starting from a perspective of protecting wildlife and nature proved effective at sparking interest and engagement with students. Below we will share examples and learning from pilots schools on each of the three strategies.

1 "Agriculture, Energy & Climate Change," Grace Communication Foundation, 2016, accessed March 8, 2018, http://www.sustainabletable.org/982/agriculture-energy-climate-change.
2 Filip Jedraszak, Antonio Matias, and Yann Avril, *A Roadmap to Reduce U.S. Food Waste by 20 Percent*, (n.p.: ReFED, 2016), https://www.refed.com/downloads/ReFED_Report_2016.pdf, Page 10.
3 "Hunger and Poverty Facts and Statistics," Feeding America, 2016, accessed March 8, 2018, http://www.feedingamerica.org/hunger-in-america/impact-of-hunger/hunger-and-poverty/hunger-and-poverty-fact-sheet.html.
4 School lunch waste among middle school students: Nutrients consumed and costs. (2013, February). Retrieved November 2018, from https://www.ncbi.nlm.nih.gov/pubmed/23332326

WHAT WE LEARNED

PREVENTION

The first and most impactful step is preventing food waste from happening to begin with; if a school cafeteria is consistently preparing too much of one dish and ultimately throwing it away, then a food waste audit will reveal that and allow for adjustments. Teaching students about the value of food and its environmental impact, coupled with additional programmatic, operational, and policy changes, can inspire brainstorming and prevention tactics.

Student Audits

Conducting student food waste audits can help schools better understand which foods are being wasted most and why. As the saying goes, what gets measured, gets managed. WWF created a simple data collection tool to allow teachers or auditors to enter data and then review a dashboard of waste totals per student and related environmental metrics.

These audits provide valuable feedback to cafeteria staff, that can eventually result in less food waste and greater plate consumption. They also encourage students to offer up creative ideas to reduce food waste in the cafeteria and, most importantly, to become key participants in the implementation of those solutions—through green teams, student council leaders, or science classes.

> At one school, students decided to reward kids with clean plates. Student ambassadors monitoring the audit handed out stickers to those that finished most of their lunch, especially to those who ate the fruits and vegetables on their plates. Plate waste decreased from 154.7 pounds to 81.6 pounds of food waste over two audits, potentially indicating that this strategy was successful in decreasing overall food waste. Though it's important to note that unless the auditor can control the menu served on audit days, there can be significant variation in food weights, and thus, the results.
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> At another school, students utilized the data collected from two food waste audits to write a grant proposal to EcoRise, an environmental literacy program that offers mini-grants to schools that aim to improve their environmental standards.
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> One teacher shared that viewing the data dashboard of results kicked off an inspired conversation with students on the carbon emissions associated with their meal and leading to an engaged brainstorm on tactics the class could test to reduce waste in their cafeteria.

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OTHER PREVENTION CONSIDERATIONS:

Kitchen Service Capabilities

There is great variety between schools in their kitchens, from the staff and training to the equipment, storage, purchasing and preparation. Some schools have a chef, nutritionist and staff who design and prepare meals on-site in a move back to from-scratch cooking, occasionally harvesting ingredients from a school gardening program. Other schools procure pre-cut, processed, and pre-packaged meals from large-scale providers that are heated and served quickly, which are often more convenient and affordable for schools that have less capacity, but they can also be higher in sodium and lower in nutrients.

> According to one staff member at a school without an on-site kitchen, switching food service providers reduced food waste by as much as 80 percent.

At another school with both an on-site kitchen and an engaged head chef, food waste—particularly fruit and vegetable waste— was much lower. Fruit and vegetable waste totaled 14.3 pounds for 95 students, an average of .15 pounds of waste per student, while another school using pre-packaged meals totaled .23 pounds per student.

One study showed that changes in school food preparation from pre-packaged to on-site scratch cooking can lead to healthier options in the cafeteria. However, we also know that simply providing healthy options doesn't mean students want to eat them, and there have been studies showing that providing more fruits and veggies can lead to increased plate waste in cafeterias. As School Nutrition Association President Becky Domokos-Bays noted, "Just like parents, school nutrition professionals know that offering kids healthier options is only half the battle – we also have to entice them to eat those nutritious choices."[5] Further study is needed to understand how kitchen service capabilities impact plate consumption and food waste prevention in the cafeteria.

Offer vs. Serve (OVS)

OVS is a relatively new provision in the NSLP and SBP that allows students to decline some of the food offered, with the aim of reducing food waste while permitting students to decline foods they do not intend to eat. There are guidelines about what foods students must still take and what they can decline. This program is required for lunch served in grades 9-12, but it is optional or encouraged for other grades for both breakfast and lunch. As most of the schools where the WWF curriculum was piloted were pre-K through 8, staff only saw implementation at a small selection of schools. There is a lack of measurement data on waste captured prior to and post implementation of the program so it is not yet possible to indicate its success. However, at the schools we spoke with that were implementing this program we heard the following:

- There is confusion on what the students can select and what is required, both of staff and students.
- Students must self-identify what selections they do not want, and they often don't have an opportunity to speak up until after they've already been served a full meal.
- There is confusion amongst teachers and cafeteria staff on the requirements to make a reimbursable meal, which often leads to a full meal being served or encouraged for fear of losing the reimbursement.
- More training, education, and improved signage is needed for both students and staff to ensure the success of this program in reducing food waste.
- As certain proportioned servings of fruit and veggies are required components, this program must be paired with other initiatives that encourage students to eat healthier options.

PREVENTION RECOMMENDATIONS:

- Implement offer vs serve during lunch, with appropriate training for teachers, cafeteria workers and students. Where possible, gather data before and after implementation of the program to learn what is working.
- Engage, train, and empower staff in prevention strategies, and in the environmental, economic and social impacts, plus their potential contribution to change.
- Be creative and experiential when offering new or unfamiliar foods. Schools offering samples, taste tests, cooking demos or integrating items grown by students in gardens often saw a decrease in waste as students were more excited to try unfamiliar healthy foods.
- Extend the lunch period or have recess before lunch. According to an **EPA and USDA guide**, these practices could each decrease plate waste by approximately 30%.
- Create fun incentives for students to reduce waste and empower student leaders to educate their peers in the issue of food waste.
- Tailor serving sizes, go trayless, or use non-plates if there is capacity for an industrial dishwasher.

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5 Johnson, L. (2016, October 11). Not Your Grandparents' Cafeteria: Why These School Lunches are a Hit with Kids. Retrieved November, 2018, from http://www1.cbn.com/cbnnews/health/2016/october/not-your-grandparents-cafeteria-why-these-school-lunches-are-a-hit-with-kids

DONATION

Realistically, there will always be some amount of excess food, and focusing on donation as a second strategy is essential to ensure the food reaches people in need in the community, rather than the landfill. Many schools are not aware that USDA allows and encourages donation of excess wholesome food from school food nutrition programs or face perceived barriers to implementing a donation program.

Fortunately, liability-related fears are largely unfounded thanks to the Bill Emerson Good Samaritan Act, which absolves those who donate wholesome food to nonprofits for distribution to needy individuals from liability related to those donations. However, in the DC-area pilots there was found little awareness about the Act.

There is also variation in qualifying foods and labeling standards at the state and local levels, which creates an additional barrier to implementation for staff with limited capacity. Foods to be donated must also be handled and stored according to certain safety standards.

> Most staff interviewed for these pilots indicated that they did not have the capacity or equipment to safely store excess food. In one recurring example, staff cited that "Milk, once it leaves the fridge, must be drank or tossed," with no way of recovering it or knowing how long it had been temperature stable.
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> In one school, however, students raised funds through their Green Club for a separate rescue refrigerator. Excess milk, in addition to other uneaten but temperature safe food, is stored immediately in the fridge, then picked up and donated to food shelters through Food Rescue US, a volunteer-run program working to connect unused meals to hungry people all over the city. The success of the program is contingent on the engagement and participation of many parent volunteers. While some schools may not have this capacity, it's an inspiring model.

Share tables are another emerging trend where students place unopened food and drinks they choose not to eat, providing an opportunity for other students to take and consume the food. For schools, if temperature safe, the food left on this table at the end of lunch periods can be donated to local food banks or pantries.

> In one DC school, an excess of uneaten bananas and milk at the close of a lunch period inspired a class to experiment with making banana ice cream for an afternoon snack. Even if the unopened food cannot be donated, this small separation step can be a useful data point to indicate items that could potentially be prevented.

DONATION RECOMMENDATIONS:

- Set up well-placed Share Tables, discuss their role with students, and track the items that remain to inform future strategies
- Allow students to keep uneaten items
- Investigate food donation protocols for safe donation, including storage and refrigeration, types of foods that can be donated locally, and a tracking system for awareness. There are often local grants available to help with putting these protocols into place.
- Connect with a local food bank or hunger relief organizations to pick up surplus foods for redistribution in your community

In the next phase of this work, WWF will be further investigating the policy, implementation and perception barriers in different regions to incorporate and encourage food recovery efforts in conjunction with partners such as Food Rescue's K-12 program, Food Bus, and Food Rescue US.

DIVERSION

Food rotting in landfills gives off methane, a greenhouse gas approximately 23 times more toxic than carbon, so where prevention and donation are no longer possible, all other excess organic material should be diverted from landfills; this can significantly decrease the carbon footprint of the school. This can be accomplished through on-site composting, organic waste hauling, or other nutrient to energy conversion options such as anaerobic digestion. Most schools do not have the resources for the latter, so this pilot focused on the first two.

The WWF Food Waste Warrior curriculum discusses compost as an option for diversion, and there are opportunities for partnership with School Garden programs that are already taking purchase across the country. In nearly every school in which the program was piloted, students excitedly brainstormed composting as a possible food waste reduction strategy.

It was encouraging to see there is already relatively broad awareness of composting; however, it is a good point of discussion to emphasize that prevention strategies should come first and foster an understanding of the resources that go into growing and distributing food. While recycling these nutrients is imperative, WWF Food Waste Director Pete Pearson has said, "We don't grow food to compost it."

OTHER LEARNINGS:

The DCPS Recycles! program allows all DCPS schools the opportunity to opt in to organics recycling. The program follows national best practices for sorting food scraps and soiled paper waste in school cafeterias and kitchens. As of 2016, more than 30 schools across all 8 wards had implemented this program. However, there are more than 111 DC public schools and 127 other learning institutions in the district. This indicates a 12% adoption rate for learning institutions across the district, so there is much room to grow this program. The program is not yet available for private or charter institutions. None of the schools that piloted the WWF curriculum had opted in to the program yet; several were not currently able to implement regular mixed material recycling due to limited resources.

In one pre-school class, observations indicated higher waste at younger ages due to inappropriate portion sizing. On average, a single classroom of 20 students wasted an average of 10 pounds per day for both breakfast and lunch. Even though her students are under the age of five, the school's meal contractor provides portion sizes intended for students much older, resulting in large amounts of food waste each day. The teacher shared these results with her school to start a conversation about changing portion sizes and worked to secure a grant that would pay for a compost hauler.

The average cost for a compost service such as Compost Cab or Veteran's Compost in DC is $8 per week but can increase depending on the amount of food that must be composted. For many schools, searching for outside funding can be essential to securing a composting service. Other schools may implement a school garden program and create an onsite compost. This may not be enough to accommodate the schools' entire organic waste stream, but it does double as an incredible learning opportunity.

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Milk is a significant source of both food waste and material waste. Because liquid can be poured down the drain, it's sometimes left out of waste measurements – but dairy can have a higher environmental footprint than fruits and vegetables, so it's important to assess. And, while many schools recycle milk cartons, if they are not clean and dry they may not be able to be recycled and may be causing contamination. Some schools are beginning to invest in "Steel Cows" or milk dispensers rather than cartons, reducing waste by self-serving in reusable cups.

DIVERSION RECOMMENDATIONS:

- Have students investigate alternative hauling or diversion opportunities as a project and share opportunities with the school leadership
- Start a compost pile as a science project
- Use the Farm2School Network for local produce and compost pick-up
- Connect with school garden programs
- Start a conversation between your food service program, custodial staff, and administration if switching to steel milk dispensers is an option for your school or district.

CONCLUSION

This project underscored the scope of the food waste problem and the many challenges that must be overcome to adequately address it in schools. The project also demonstrated that teachers, students, and staff are more than capable of changing the system—if they work together to foster a school culture focused on reducing food waste. All the recommended tactics are most effective when they become an integral part of a school's culture and part of an annual expectation for senior grade levels to manage. That kind of change requires champions—from environmental coordinators to inspiring teachers or student leaders.

The Food Waste Warrior program aims to introduce students to a new way of thinking about food and create programs in schools that live on each year. For many students, the connection between the food on their plate, the environment that sustains them, and the wildlife they love is tenuous at best. By teaching people how food production and food waste impacts wildlife, we can inspire a new generation of food waste warriors.

Appendix

FOOD AS AN INSTITUTION

The topic of food waste in schools is often considered highly politicized. There have been political considerations since the National School Lunch Act was signed in 1946 by President Harry Truman, and they are complicated by the need for foodservice directors in schools to meet federal, state, local and parental demands for nutrition, safety, and lunchroom participation. And reducing food waste is not the top priority for all players. While wasted food is wasted nutrients, there are often unintended effects of nutritional policy.

More recently, in 2010, the Healthy, Hunger-Free Kids Act was signed, requiring schools to adhere to updated nutrition standards that encouraged healthier options in the cafeteria, such as more fruits and vegetables and less sodium in food. For a school to receive federal reimbursement, a lunch must consist of three of the five components: fruits, vegetables, whole grains, low-fat dairy, and a protein. However, some studies showed a resulting increase in plate waste[6], leading to politicized critique of the law.

Since the nutrition standards were updated again in 2014, more school meal programs have begun initiatives to encourage students to eat healthy choices by making them more appealing.[7] In 2016, 72.3% of schools instituted student taste testing and 18.4% utilized chef partnerships to develop menus, up from 64.4% and 12.3% respectively in 2014.[8] The creativity of food service professionals is essential in both encouraging students to eat healthy food and ensuring it does not go to waste. We know there was plenty of waste before the Act, and we need to focus on what is fixable in the short term, and plan for what we can fix in the future.

Another suite of issues to raise involve profitability, which is not always in line with food waste reduction. Food service providers want to sell food. Food service directors are often under pressure to get students to buy lunch to obtain reimbursements, not eat lunch. But there are also comparative cost issues, for example - as the federal reimbursement rate is the same for all school districts, but in areas where nearly 100 percent of the student body receives free or reduced-price meals, it is more difficult to cover the full plate cost than in areas where students pay the full price.[9] This reimbursement gap makes it extremely challenging to serve higher quality, more expensive food. Schools also don't receive full reimbursement if full meals aren't served, so even if a school is "offer" rather than "serve," full meals are often given regardless of student preference to ensure full reimbursement.

Possible solutions may be to test practices that both reduce waste and encourage consumption of fruits and vegetables according to recommended dietary guidelines. There is much to be learned and much work to be done.

Learn more at **worldwildlife.org/foodwaste** and **worldwildlife.org/foodwastewarriors.**

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