



# Preventing Wasted Food in Schools

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## MN GreenCorps Program

The Minnesota GreenCorps program is a statewide initiative, coordinated by the Minnesota Pollution Control Agency (MPCA), to preserve and protect Minnesota’s environment while training a new generation of environmental professionals.

The program places AmeriCorps members with host organizations around the state to assist communities and local governments in addressing a variety of statewide needs, aiming to:

- Reduce solid waste and increase recycling in Minnesota communities.
- Reduce greenhouse gases (GHG) and other air pollutants.
- Reduce water runoff and improve water quality.
- Assist community members to take eco-friendly actions.
- Increase community resilience and build local capacity to respond to the threats of climate change.
- Train new environmental professionals.

Dakota County applied to host a Minnesota GreenCorps Member for the September 2018-August 2019 term to execute several projects in the waste reduction, recycling, and organics management track. Hannah Keller was selected by MPCA staff to be assigned to Dakota County for the eleven month program term. This report focuses on the school pilot project only.

## Background

The food and agriculture industry consumes up to 16 percent of U.S. energy, almost half of all U.S. land and account for 67 percent of the nation’s freshwater use. The United States throws away 40 percent of food which equates to one-fifth of U.S. cropland, fertilizers, and agricultural water, and 1.3 percent of the US Gross Domestic Product<sup>1</sup>. Food is also a valuable resource when feeding people in need. One in eight children struggles with hunger in the U.S. with 11,570 of them living in Dakota County<sup>2</sup>.

In an effort to mitigate the resource losses, Dakota County has developed numerous wasted food educational resources for residents, including a four-week Food Waste Challenge, worksheets and handouts, and a media campaign. These efforts have aimed to reduce household food waste, but do not address food waste in businesses or schools.

### Words Matter

Dakota County prefers the term “wasted food” when talking about prevention measures.

“Food waste” puts the emphasis on the waste and what to do with it. “Wasted food” highlights the food and how to save it.

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<sup>1</sup> Gunders, Dana, Natural Resources Defense Council (2017) *Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill*

<sup>2</sup> Feeding America, *Map the Meal Gap 2019*, <https://map.feedingamerica.org/county/2017/overall/minnesota>

## Dakota County School Wasted Food Prevention Project

School cafeterias offer an opportunity to reduce wasted food and educate students. Efforts to educate students on the impacts of wasting food can yield key results over time and influence the next generation of grocery shoppers. With this in mind, Dakota County staff wanted to update the existing School Recycling Program to include wasted food prevention tactics and resources to help partner schools. The 2018-2019 Minnesota GreenCorps Member developed a pilot project to determine how wasted food can be addressed in schools.

The goals of the wasted food prevention project were to:

- Evaluate barriers and opportunities to preventing wasted food in K-12 schools
- Pilot best practices to reducing wasted food in school cafeterias
- Measure wasted food before and after implementation
- Evaluate results to understand what best practices work
- Provide recommendations to enhance the School Recycling Program

### Recruitment

One of the first steps in launching the wasted food prevention project was recruiting pilot partner schools. Public schools were determined to be the target partners, considering the majority of schools in Dakota County are public schools, and the U.S. Department of Agriculture (USDA) National School Lunch Program used in public schools creates a standardized lunch environment. This allows the opportunity for successful wasted food prevention strategies revealed through the pilot project to be easily replicated in other public schools. In addition, a variety of school age ranges were desired to be represented in the pilot partner schools to compare wasted food generation and the success of different approaches at different age levels.

All nine school district superintendents in Dakota County were notified of the pilot project to ensure their approval and awareness of the project. Subsequently, all eight nutrition services district supervisors were contacted (one supervisor handles two school districts). Upon their approval for schools in their district to participate, recommendations for pilot partner schools were solicited. School principals of recommended schools were contacted and agreed or declined to participate. After these recruitment steps, the following three elementary schools, one middle school, and one high school committed to participating in the pilot project:

- Burnsville-Eagan-Savage Public Schools Independent School District (ISD) 191  
**Gideon Pond Elementary School**, Burnsville, 450 students
- Rosemount-Apple Valley-Eagan Public Schools ISD 196  
**School of Environmental Studies**, Apple Valley, 400 students
- West St. Paul-Mendota Heights-Eagan Area Schools ISD 197

**Garlough Environmental Magnet Elementary School**, West St. Paul, 400 students  
**Heritage E-STEM Middle School**, West St. Paul, 700 students

- Inver Grove Heights Schools ISD 199  
**Pine Bend Elementary School**, Inver Grove Heights, 550 students

Project kickoff meetings were held at each partner school during which a school project lead was assigned. District nutrition staff, school kitchen and custodial staff, the school principal, and other interested staff were invited to attend kickoff meetings to give the opportunity to all stakeholders to contribute input on the project. A pledge of support (Appendix O) was signed by the school lead, GreenCorps member, and Dakota County staff.

### Measuring Wasted Food: Tray Audits

Measurement techniques were researched to understand the amount of wasted food coming from student lunch trays. The process outlined in the EPA/USDA *Guide to Conducting Student Food Waste Audits*<sup>3</sup> gave the most specific information on cafeteria wasted food generation. The Minnesota GreenCorps member determined that “tray audits” should be conducted at partner schools to be able to characterize the wasted food in terms of:

- How much food and beverage items are wasted?
- Which types of food are being wasted the most?
- Why are students not eating particular food items?
- Which lunch period wastes the most? What factors may be impacting them?

Tray audits differ from traditional waste audits because they measure each food category (e.g. entrée, fruit, salad, etc.) and ask students why they did not finish their food. This gives a much more detailed report of what and why food is being wasted. Lunches brought from home were not included in this measurement. This tray audit process is summarized in the *Tray Audit Guide* (Appendix A) and video [Dakota County School Tray Audit](#) can be found at [www.dakotacounty.us](http://www.dakotacounty.us), search *tray audit*.

Each project partner school chose two to four days in early 2019 to conduct tray audits during all lunch meal periods. This round of tray audits is referred to as “pre-



Figure 1. Students helped survey their classmates during tray audits.

<sup>3</sup> Guide to Conducting Student Food Waste Audits  
[https://www.usda.gov/oce/foodwaste/Student\\_Food\\_Waste\\_Audit\\_FINAL\\_4-6-2017.pdf](https://www.usda.gov/oce/foodwaste/Student_Food_Waste_Audit_FINAL_4-6-2017.pdf)

project tray audits” in this report because they measured wasted food generation prior to any wasted food prevention strategy implementation. Tray audits that were conducted after strategy implementation are referred to as “post-project tray audits”. To ensure that pre- and post-project tray data was comparable, tray audit dates were chosen when a common, regularly-served meal was offered.

### **Pre-Project Tray Audit Findings**

Upon completion of pre-project tray audits, the data collected was analyzed and summarized into a pre-project tray audit report for each partner school. The reports include a summary of the tray audits, key findings, recommendations for improvement, and resources. Full pre-project tray audit reports for each pilot partner school are attached in Appendices B-F. The key, overarching findings and problem areas related to wasted food across all pilot partner schools are discussed in this section.

#### ***Unopened, Uneaten, Packaged Items***

Each school was found to waste between 16 and 125 unopened, uneaten, packaged items each day. Larger schools tended to generate more of these items, indicating that the generation of these items is proportional to school population. This is an average of 51.4 packaged items being wasted per day per school.



Figure 2. Food unopened or uneaten from one lunch period at one school.

If a Share Table was in use at a partner school during pre-project tray audits, items placed on the Share Table were not included in the count of unopened, uneaten, packaged items going to waste. Items placed on a Share Table are not considered to be wasted. It is noted that the presence and commotion of the tray audit station could have distracted students and potentially prevented them from using an existing Share Table.

#### ***Most-Wasted Food Categories***

The top three most wasted food categories across all five partner schools by weight were milk, entrées, and fruit. Milk waste per student ranged from 0.04 pounds per student to 0.12 pounds per student per day. Entrée waste per student ranged from 0.03 pounds per student to 0.08 pounds per student. Fruit wasted per student ranged from 0.03 per student to 0.10 per student per day.

### ***Students with Leftovers***

The pre-project tray audit findings showed 43 to 83 percent of students had leftovers on their lunch trays. Younger students had a higher likelihood of having leftovers on their tray, but a significant portion of all students at all age levels had leftovers from lunch.

### ***Most Common Interview Responses***

Students with tray leftovers were asked why they were unable to finish their food during the pre-project tray audits. At various times, surveys were given by the Member, adult volunteers, county and school staff, or student volunteers. The most common responses students gave were “I got too full”, “I took too much”, or “I didn’t have enough time to finish”. The most common responses when students were asked specifically about why they were unable to finish their milk was “I had to take it” or “I wasn’t thirsty” and interviewers noted that there was not another beverage option in the lunchroom other than milk.

It is noted that students, particularly younger students, are influenced by responses given by their classmates. For example, if one student being interviewed during the tray audits says “I got too full”, the next student in line to be interviewed hears that response and says something similar. Additionally, younger students can be confused about why they are being questioned about their leftovers, which could have affected their interview responses. Even after classroom or lunchroom announcements to make students aware that they were going to be interviewed about their lunch leftovers, students may still have had the impression they were in trouble for not completely finishing their meal.



Figure 3. Tray leftovers were common.

### **Best Practice Implementation**

This section of the report describes the wasted food reduction strategies that were implemented in this pilot project. Many of the strategies implemented were inspired by The Smarter Lunchrooms Scorecard which contains 60 simple, no- or low-cost strategies that schools can use to increase participation, improve consumption of healthy food, and reduce food waste. The strategies are based on research from the Cornell University B.E.N. Center, other universities, and partners.<sup>4</sup>

Upon completion of pre-project tray audits, meetings were held at each partner school to discuss the pre-project report with district nutrition staff, school kitchen and custodial staff, the

<sup>4</sup> <https://www.smarterlunchrooms.org/scorecard>

school principal, and other interested staff. This team of stakeholders was asked to select recommendations of wasted food reduction strategies listed in the report tailored to the specific school's results. Guidance was offered by the Member and Dakota County staff, if needed. Staff recommended implementing chosen strategies for a minimum of a month before conducting post-project tray audits to allow all changes to be routine for students.

***Best Practice: Conduct Tray Audits***

Partner schools that implemented this strategy: Garlough Environmental Magnet Elementary School, Gideon Pond Elementary School, Heritage E-STEM Middle School, Pine Bend Elementary School, School of Environmental Studies

Tray audits allowed schools and Dakota County to select what wasted food prevention strategies would be most relevant to that school to implement. Tray audits were also a way to get students involved in wasted food measurement and in some cases have them take leadership opportunities in the project. Lastly, regular tray audits can keep track of each school's progress in reducing the amount of wasted food generated. See more information on conducting tray audits in the Tray Audit Process section above.



Figures 4 and 3. Students, staff and volunteers helped sort milk and food.

***Best Practice: Provide Share Tables***

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School\*, Gideon Pond Elementary School\*, Heritage E-STEM Middle School\*, Pine Bend Elementary School\*, School of Environmental Studies

*\*had an existing form or a Share Table before the pilot project*

Share Tables are a place for children to place unconsumed food and beverage items that they have chosen not to eat or drink. This provides other children the opportunity to take additional helpings of food or beverages at no additional cost. Items considered to be unopened, uneaten, and packaged such as sealed milk cartons, sealed PB+J sandwiches, cheese sticks, applesauce



cups, diced fruit cups, salad dressings, raisins packets, and whole unbitten fruit such as bananas, apples, oranges, and pears are eligible to be placed on a Share Table. Items placed on the Share Table must have come from the school’s lunch service. Share Tables are approved by the USDA<sup>5</sup>, Minnesota Department of Health, and the Minnesota Department of Education. The Minnesota Department of Education has a variety of resources related to Share Tables including guidelines, temperature logs, standard operating procedures, and an informational video<sup>6</sup>.

Some schools had formal or informal Share Table practices in place prior to the wasted food prevention pilot project, but the Share Tables were unlabeled, unattractive, dirty, and students were unclear how to use them. Each partner school was provided a new Share Table. The cart selected was chosen for its attractive and eye-catching color, low height to accommodate younger students, ability to fold in half for easy storage, and light weight. In addition, a Share Table sign was developed to establish the purpose of the new table. The signs mimic Dakota County’s other waste receptacle bin labels. The Share Table sign is purple to coordinate with Dakota County’s reuse program color and includes the text “Share Table, unopened, uneaten, packaged items”. Two versions of the sign were created: a breakfast sign that includes images of items commonly placed on a Share Table at breakfast (e.g. milk, cereal, and apple juice) and a lunch sign that images of items commonly placed on a Share Table at lunch (e.g. milk, carrots, and sandwiches).

Share Tables and signs were placed in all eating areas where packaged foods are generated and disposed of. For example, at Heritage Middle school, breakfast is eaten in classroom common areas, so Share Tables were placed in these common areas to capture packaged items that may be going to waste. Students were made aware of the Share Tables and its purpose through lunch time announcements, student-made videos, and student ambassadors.



Figure 5. Uninviting Share Tables transformed.

<sup>5</sup> USDA Share Table Guidelines

[https://fns-prod.azureedge.net/sites/default/files/cn/SP41\\_CACFP13\\_SFSP15\\_2016os.pdf](https://fns-prod.azureedge.net/sites/default/files/cn/SP41_CACFP13_SFSP15_2016os.pdf)

<sup>6</sup> MN Department of Education, Share Table Guidelines <https://education.mn.gov/MDE/dse/FNS/SNP/gen/safe/>

### ***Best Practice: Give Access to Water***

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School, Gideon Pond Elementary School, Heritage E-STEM Middle School

During tray audit interviews, the most common response students gave for being unable to finish their carton of milk was that they were thirsty, but milk was the only beverage option available to them. Only one school had a drinking fountain in the cafeteria. In some schools, students were allowed to get up and leave the cafeteria to get a drink of water from the nearest hallway drinking fountain. In other schools, students were not allowed to leave the cafeteria or get up from their seats at all.

Three partner schools chose to offer water in the cafeteria as an alternative to milk using a water dispenser and compostable cups (all schools had organics recycling available). The elementary schools were given one three-gallon dispenser and the middle school was given three water dispensers to accommodate their larger student population.

Initially, school staff was concerned over the potential for spilled water and potential distractions caused by the dispenser. After a few weeks of implementation, staff testimonials indicate that these concerns were not a problem. Some teachers and staff commented that the water dispenser offered another benefit as a good fine motor skill exercise for younger students as well. In addition, this project brought to light that all schools participating in the National School Lunch Program (NSLP) must make potable water available to children at no charge in the place where meals are served during the meal service to follow all NSLP requirements<sup>7</sup>. Only one out of five partner schools were successfully meeting this requirement. Therefore, this implementation also helped the schools fulfill a requirement.



Figure 6. Water was offered to students as an alternative to milk.

### ***Best Practice: Serve Different Portions***

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School

<sup>7</sup> Child Nutrition Reauthorization 2010: Water Availability During National School Lunch Program Meal Service <https://fns-prod.azureedge.net/sites/default/files/cn/SP28-2011osr.pdf>

During tray audit interviews, students commonly claimed they were unable to finish their lunch because it was too much food. The USDA National School Lunches Program has some portion-size requirements for schools to receive reimbursements for meals, yet some entrée portions could be cut and still fall under the requirements. For example, personal pizzas, grilled cheese sandwiches, and hamburgers can be offered at half-size portions.

Elementary schools typically have students select their meal choice for the day in the morning. Most schools were already allowing younger students to request half-size portions in their morning selection; however, this practice was not standardized across classrooms and may not have always been offered to older students. Garlough Environmental Magnet Elementary School standardized their morning meal reporting sheets and offered half size entrée portions to all grades.

Cafeteria staff members were concerned that students would forget what size they selected once they came to the cafeteria. Some teachers chose to remind their students of their morning meal choice directly before lunch so that students that did request a half size portion can correctly tell the cafeteria staff their order. This made it easier for cafeteria staff to have their production records match what was served

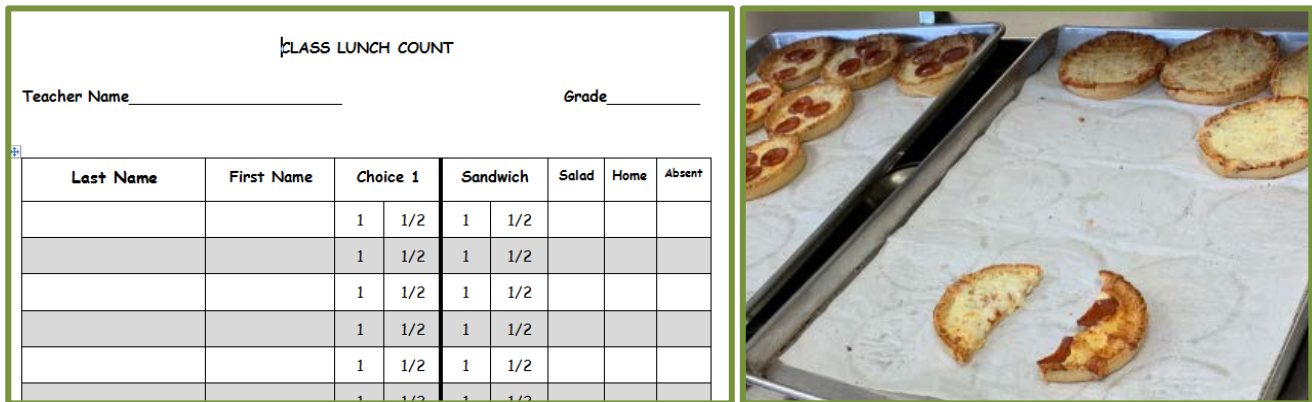


Figure 7. Garlough Elementary tried out half-sized entrée portions.

**Best Practice: Use “Time to Eat” reminders**

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School

Students often have a very limited time period to eat lunch. The Minneapolis Public Schools [True Food, No Waste: A Food Waste Action Plan](#) cites that teachers in one of the schools dim the cafeteria lights and request quiet during the last five minutes of each lunch period. This is

an effort to refocus students' attention on finishing their meal and improve their time management<sup>8</sup>.

Dimming the lights in cafeterias is not always a possibility for schools due to overlapping lunch schedules, yet verbal reminders are also effective. Cafeteria monitors or staff can give eating reminders and prompts towards the end of the meal periods to help students manage the time they have to eat. Garlough Elementary used verbal reminders as well as dimming the lights and starting quiet time during the last five minutes of lunch. In addition to helping students to focus on eating, teacher testimonials from Garlough Elementary indicate this change helps with student behavior during transitions from the lunch period back into class time.

***Best Practice: Educate on USDA Meal Requirements***

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School, Pine Bend Elementary School, School of Environmental Studies

In the interview portion of the pre-project tray audits, surveyors observed that many items on a student's tray go completely untouched or are only partially eaten. Students replied that they took the items because they "had to". Generally, it was found that both students and school staff were uninformed or confused about reimbursable meal requirements.

Across schools, most confusion surrounds the Offer vs. Serve meal service requirement. The USDA shared resources to provide clarity<sup>9</sup>:

- It is not required to take a milk if other meal requirements are met
- You must take a half cup of a fruit OR vegetable
- You have to have three item types (dairy, protein, fruit, vegetable, grain)

Partner schools chose to educate students and cafeteria staff on USDA meal requirement in an effort to allow students to be aware of what is required of them and potentially be able to make choices that would minimize the amount of wasted food they generate. Additionally, students armed with this knowledge may be able to move through the lunch line more quickly and save more of their lunch time for eating.

At schools with younger students, education is focused on specific problem items to avoid overwhelming students with information. For example, Pine Bend Elementary had a school assembly about results from the tray audit and let students know that they are not required to take a carton of milk.

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<sup>8</sup> True Food, No Waste: A Food Waste Action Plan for Minneapolis Public Schools  
[https://nutritionservices.mpls.k12.mn.us/true\\_food\\_no\\_waste](https://nutritionservices.mpls.k12.mn.us/true_food_no_waste)

<sup>9</sup> Lunch Meal Pattern  
<https://fns-prod.azureedge.net/sites/default/files/cn/MealPatternsSY19-20.pdf>  
2019 Preventing Wasted Food in Schools – Dakota County



Figure 8. Fridge for perishable items.

**Best Practice: Try a Mini Fridge and Cooler Program**

Schools that implemented this strategy: Garlough Environmental Magnet Elementary School, Heritage E-STEM Middle School

Heritage Middle and Garlough Elementary had high quantities of items left on the Share Table that kitchen staff was unwilling to cycle back through the lunch service. To mitigate this, Dakota County supplied NSF-certified small fridges to both schools to store the excess perishable items. The fridges are housed in the offices of the 360 Communities family support worker who were already distributing non-perishable snacks to hungry children throughout the day. After both breakfast and lunch meal services, staff or student volunteers go around to all Share Tables and take all perishable items to the mini fridge. In addition to the mini-fridge at Heritage Middle School, ten cooler lunch bags were purchased so that each Friday excess perishable items remaining in the mini fridge are given to students to take home for the weekend.

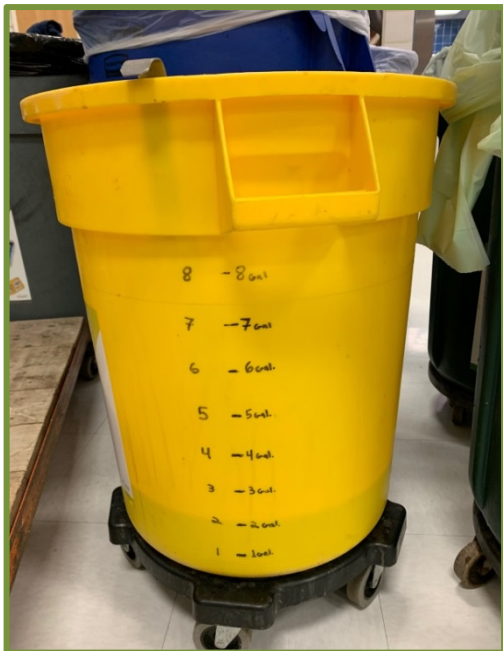


Figure 9. Measuring milk waste.

**Best Practice: Introduce a “One Last Sip” Campaign**

Schools that implemented this strategy: Pine Bend Elementary School

Inspired by a challenge hosted by a custodian at Sioux Trails Elementary in Burnsville, a “One Last Sip” campaign asked students to take one more sip of their milk before getting up from their seat to sort their waste. The effort brought awareness to students on how much milk and food gets wasted at lunch by directly involving them in milk waste measurement and goal setting. Pine Bend Elementary hosted a milk waste challenge from March-early June 2019. Their liquids bucket in their waste sorting line was marked with gallon markings. After all lunch periods were over, students on the student Green Team recorded how much milk was wasted to keep track of their progress day-to-day.

### **Best Practice: Offer a Flavor Station**

Schools that implemented this strategy: Heritage E-STEM Middle School, School of Environmental Studies

A flavor station is any area where students can self-select spices and low-sodium sauces to add extra flavors to their raw and cooked vegetables, fruits, salads, and entrees. This gives students the ability to customize their meals, and provide them with choice and variety without having to change the menu. A school district dietician recommended spice blends for the Flavor Stations that were herb- and spice-based and contained no sodium to stay under the sodium targets defined by the National School Lunch Program<sup>10</sup>.

Students at one particular school were bringing in a spice blend called Tajin. In this case, a low-sodium version of the spice was approved by the dietician and added to their Flavor Station.

The Flavor Stations were implemented at one middle school and one high school, assuming that older students (grades 5-12) were aware of their taste preferences and allergies. All spice blends were labeled with spice contents, so that students with allergies could identify whether it was safe for them (See Appendices G-H).



Figure 10. Older students can spice up their meals.

The spice blends on the Flavor Stations

- “Pump Up Your Potatoes” to use on potatoes
- “Veggie Spice” to use on vegetables
- “Fall Flavor for Carrots and Squash” for squash and carrots
- Crushed red pepper flakes
- Ground black pepper & granulated garlic called “Garlic Pepper”
- Black Pepper
- Low-Sodium Tajin (at Heritage Middle School only)

### **Post-Project Tray Audit Findings**

After the wasted food prevention strategies were implemented in each school for at least two weeks, post-tray audits were conducted to document any changes. The data collected was analyzed and summarized in a brief final project report for each partner school. The reports include a summary of the pre- and post-tray audits, key findings, recommendations for further

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<sup>10</sup> <https://www.fns.usda.gov/school-meals/tools-schools-sodium>

improvement, and resources. Final project meetings were held at each partner school to discuss the final report and included the district nutrition staff, school kitchen and custodial staff, the school principal, and other interested staff. Gideon Pond Elementary could not finish their strategy implementation and had scheduling conflicts; therefore, a post-audit was not completed at their school.

All schools that completed post audits saw a reduction in at least some food waste categories where their strategy efforts were focused. Additionally, all schools that participated in the pilot project say that the project was a great learning opportunity and overall brought more awareness and energy surrounding wasted food in their schools. All schools that participated in this pilot project saw different levels of change in wasted food generation, as all schools implemented different strategies, and had variables unique to each school.

The final project reports for each partner school that completed post-project tray audits are listed in Appendices I-L. A summary of project highlights are given for each partner school in this section.

#### ***Garlough Environmental Magnet Elementary School***

**Strategies implemented:** Share Table, Access to Water, Different Portions, “Time to Eat” Reminders, Educate on USDA Meal Requirements, and Mini Fridge and Cooler Program

See the final project report in the Appendix I.

- Overall wasted food per student decreased by 23 percent
- Entrée wasted food per student decreased by 38 percent
- Wasted milk per student decreased by 16 percent, which is 1,023 pounds of milk waste prevented per school year. This is equivalent to saving 125,927 gallons of water from going to waste every year.<sup>11</sup>
- Wasted food decreased across all four meals tested and across all grades. This shows that decreases are consistent across the variety of meals tested.
- 8 percent decrease in the number of students who had any leftovers at all.
- 23 percent fewer unopened, uneaten, packaged items came to the audit station in the post-project audits than the pre-project audits. Assuming this decrease can be attributed to an increased use of the Share Table, the Share Table prevented 15 items over the 4 audit days from going to waste.
- 14 percent of students drank water from the portable water dispenser during the post-project tray audits. The three gallon dispenser was emptied approximately once

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<sup>11</sup> Water footprint of crop and animal products: a comparison

<https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/>

per day, meaning total student water consumption increased by three gallons per day.

### ***Gideon Pond Elementary School***

Strategies implemented: Share Table, Access to Water

Due to staff turnover and scheduling conflicts, Gideon Pond Elementary was unable to complete post-project tray audits on days where the same meal was served as the pre-project tray audits. Gideon Pond was able to implement a water dispenser for one day during one post-project tray audit. During this day, 14 percent of students drank from the dispenser. There is no final report for this project partner school.

### ***Heritage E-STEM Middle School***

Strategies implemented: Share Table, Access to Water, Mini Fridge and Cooler Program, Flavor Station

- 19 percent of students drank water from the portable water dispensers. Two three-gallon dispensers were emptied twice per day, meaning total student water consumption increased by twelve gallons per day.
- Wasted milk per student decreased by 36 percent. This significant reduction is consistent across all grade levels. The milk waste reduction seen in the post-project audit results would equal 2,036 pounds of milk waste per year, assuming 500 students reduced their milk waste by 0.02 pounds per day for a whole school year. This is equivalent to preventing 218,846 gallons of water from going to waste every year.
- 6.1 percent decrease in the number of students who had any leftovers at all.
- The new Share Table prevented 60 items from coming to the audit station over the two post-project tray audit days.

See the final project report in the Appendix J.

### ***Pine Bend Elementary School***

Strategies implemented: Share Table, Educate on USDA Meal Requirements, “One Last Sip” Campaign

- Wasted milk per student decreased in the post-project audits by 32 percent. This is equal to preventing 2,700 pounds of milk waste per school year and is equal to saving 329,994 gallons of water from going to waste.
- Students with leftovers decreased by 17 percent
- The total number of items eligible to be shared decreased by 51 percent, meaning less unopened, uneaten, packaged items were being generated.
- The total amount of unopened milk cartons, which was the most common unopened item in the pre-project audits, decreased by 79 percent in the post-project audits.



See the final project report in the Appendix K.

### ***School of Environmental Studies***

Strategies implemented: Share Table, Educate on USDA Meal Requirements, Flavor Station

- Overall wasted food per student decreased by 35 percent
- The top three wasted food categories were milk, entrées, and fruit in both pre-project and post-project audits. These wasted food categories were reduced by 41 percent, 23 percent and 36 percent by weight in the post-audits, respectively.
- Wasted milk per student decreased by 41 percent, which prevents 330 pounds of milk waste per school year. This is equivalent to preventing 40,333 gallons of water from going to waste every year.
- In the pre-project audits 100 percent of uneaten, unopened, and packaged items came to the audit station and were sorted as trash. In the post-project audits, 46 percent (22 items out of 48 items) were instead placed on the Share Table.
- 43 percent fewer unopened, uneaten, packaged items were generated in the post-project audits.

See the final project report in the Appendix L.

### **Breakfast Audits at Heritage E-Stem Middle School**

While conducting tray audits to measure wasted food coming from cafeteria lunches, school staff informed the Member that lunch is not the only meal where large amounts of wasted food occur. Breakfast-in-the-Classroom programs serve morning foods to students to make sure they are ready to learn for the day. In an effort to understand how much and what type of wasted food is generated at breakfast in schools, a breakfast audit was conducted at Heritage E-STEM Middle School. Heritage students are offered breakfast in the classroom every day at no cost. As students head to their homeroom area when they get to school, they grab a bag of breakfast food items from the school cafeteria. Students have homeroom classes separated into wings of the building. Each wing has three to six homeroom classrooms. During homeroom, approximately a 30-minute period, students are allowed to eat their breakfast in their classrooms. After the homeroom period is over, students exit their classroom and sort their breakfast waste in their respective wing's common area where trash, recycling, organics, and in some cases a Share Table are located. On the dates of Friday, April 12, and Monday April 15, a homeroom classroom and the respective wing common area was observed during the breakfast period. Food that was disposed of in the classroom bins and the common area bins, if any, was noted. The amount of unopened, uneaten, packaged items ended up on the Share Table was also noted.

General observations made at the breakfast audits:

- Many students placed their entire plastic bag of unopened items onto the Share Table, rather than placing each item onto the table. The items still in bags may be a barrier to students to take the item off the Share Table.
- Heritage’s E-STEM magnet Coordinator indicated that some teachers view Share Tables in the common areas as a distraction when food is left out all day because students will eat too often in the middle of class. After the transition period between homeroom and 1<sup>st</sup> period when students sort and use the Share Table, teachers in some common areas will put the Share Table in the teachers’ lounge away from students. Any food left on it will get wasted. The majority of common areas leave their Share Table out all day.
- One homeroom class sorted their waste in the common area together as a class near the end of their period. The homeroom teacher stood behind the sorting station. This seemed to improve the cleanliness of the recycling and organics and prevented packaged items from being wasted.
- The most common items on the Share Tables at breakfast were yogurts, milk cartons, and carrots, all perishable items.
- 67 Share Table items were collected on April 12 and 77 Share Table items were collected on April 15.
- Some common areas did not have a Share Table at all. No Share Tables were marked indicating its purpose.

### Survey of District Nutrition Services

Dakota County staff did not know which schools and school districts had policies or strategies already in place to prevent wasted food. Each school district in Dakota County was sent a survey in late March 2019 (Appendix M) to hear about efforts schools outside of the pilot project were making to prevent wasted food and to determine what resources Dakota County could provide to school districts to assist in their efforts.

Eight of the nine Nutrition Services Director/supervisor (one supervisor serves two school districts) responded to the survey.

Key findings from this survey include:

- One school district had a formal Share Table policy.
- Seven respondents indicated that they use a Nutrient Analysis Software [approved by the USDA](#) for menu planning and tracking wasted food.
- A majority of respondents (87%) indicated that Share Tables are a school-level practice and are not enforced by the district.

- A majority of respondents (87%) indicated simple signage as the main means of communicating the purpose of a Share Table.
- Elementary schools typically offer recess before lunch to at least some grades.
- Resources identified to meet District needs to properly address wasted food:
  - Lakeville Public Schools, ISD 194 Cafeteria Inventory: “We would happily accept sample policies on share tables and signage for share tables”
  - Rosemount-Apple Valley-Eagan Public Schools, ISD 196 Cafeteria Inventory: “Guidance in the form of informational videos. One for students and one for building staff. Videos would need to be less than 90 seconds”
  - West St. Paul-Mendota Heights-Eagan Area Schools, ISD 197 Cafeteria Inventory: “Signage, guidance from cafeteria support staff & classroom teachers.”
  - Hastings Public Schools, ISD 200 Cafeteria Inventory “Signage and Share Table grants”

### Project Conclusions and Next Steps

This pilot project demonstrates that there are many effective strategies schools can implement to prevent food from being wasted. Schools making small efforts to address wasted food can lead to large impacts over the course of a school year and beyond. Each of the school partners had unique needs and opportunities to prevent wasted food. As a result of this project, **Dakota County can now provide expertise and resources to schools interested in preventing wasted food.** Several resources were created by the Minnesota GreenCorps Member to help schools reduce wasted food:

- Wasted Food Prevention Best Practice factsheet (Appendix N)
- A [video](#) explaining how to conduct a tray audit
- A written guide to conducting a tray audit (Appendix A)
- A sample weight log to use during a tray audit (Appendix O)
- A sample interview log to use during a tray audit (See Appendix P)

### Spreading the Word

The MN GreenCorps member has shared the findings and lessons learned from this project with many partners.

Dakota County hosted the fifth annual School Recycling Workshop on Wednesday, July 17 at the Dakota Lodge in West St. Paul. The audience included 50 school personnel – administrators, building and grounds staff, teachers, food service staff and Green Team leaders. The results of the wasted food project and strategies for success were shared. Survey results show that 100 percent of participants found the workshop valuable and 100 percent of participants plan to change their actions or make improvements as a result of attendance.

Another presentation was given at the September *Food: Too Good to Waste* conference call hosted by the Environmental Protection Agency with food waste program leads from around the country.

### ***Updated School Recycling Program***

The Minnesota GreenCorps member's findings have shaped the new School Recycling Program so that resources and funding can be provided to schools to reduce their wasted food.

### ***Future considerations***

- Addressing Back of house needs. There are many ways the back of house or kitchen prep areas of school cafeterias can address wasted food. This can include ensuring a USDA approved Nutrient Analysis software is used for meal planning and tracking wasted prepared items, reviewing sales report in the point of sale system to see which items are less popular, and replacing or reformulating them for broader appeal.
- Incorporate Share Tables into yearly sorting behavior education. This pilot project kicked off after the start of the 2018-2019 school year. While efforts were made in many school partners to educate students verbally in addition to the new signage on how to use the new Share Tables, educating students at the start of each semester may be most effective to incorporate the use of the Share Table into student's regular sorting behavior
- Bulk milk dispensers. Milk was found to be one of the most wasted food categories by weight due to unfinished, opened milk cartons and one of the most wasteful foods to create<sup>12</sup>. If other meal requirements are met (e.g. taking servings of fruit, vegetables, and a protein), students are not required to take milk in order to qualify for a reimbursable meal. Bulk milk dispensers allow students to pour the amount of milk they think they will be able to finish, resulting in less waste and cost savings for lunch programs.
- Extend lunch periods. Due to timing and school partner logistics, extending lunch meal periods is not something that was able to be piloted. The Smarter Lunchrooms Movement and the USDA Food and Nutrition Service state that extending lunch periods from 20 to 30 minutes can reduce student plate waste as much and one third.

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<sup>12</sup> <https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/>



# School Tray Audit Guide

When we throw away or compost food that could have been eaten, all the resources that went into making the food are also wasted. We have the chance to keep a large amount of food from going to waste in our schools and to be part of the solution. Before your school can prevent the amount of food wasted every day, it's important to first understand how much is being wasted and why.

A tray audit is a measurement technique to assess the wasted food coming from student lunch trays. Audits can help answer questions such as:

- How much food and beverage items are not eaten?
- Which types of food are being wasted the most?
- Why are students not eating particular food items?
- Which lunch period or grade wastes the most? What are the reasons behind this?

Based on the findings of a tray audit, opportunities to reduce wasted food naturally appear.

## Step 1: Plan your tray audit

### Assign a project lead or coordinator

The project lead will develop plans, recruit a team, ensure accountability, and execute follow through.

### Determine where and what you want to measure

Determine areas within the school where food is wasted. This is often in the cafeteria and kitchen areas, but can also be in classrooms and other common areas. Think of both breakfast and lunch. Determine which areas and which meals make sense based on your goals to measure wasted food at your school. Then, identify where the tray audit station area will be. The audit station should be located within or near the area where wasted food occurs and in an area that can accommodate small messes (avoid carpet). Ensure that you have enough space for 2-3 long folding tables for food sorting and 1-2 folding tables for student interviews.

### Determine your sample size

Choose a sample size of meal periods and menu options to audit. For example, you may want to audit all menu options occurring over breakfast and lunch periods for one day or you may want to target one lunch period or grade level for multiple days. Keep in mind that the more days and meal periods you choose to sample, the more information you will have to determine where to address your wasted food prevention efforts.

### Work with your kitchen staff

Let your kitchen staff know about your interest in reducing wasted food in your cafeteria and explain the tray audit process. Solicit recommendations for which meals would be best to conduct a tray audit. Pick a meal that is served regularly so that it can be tested in the future. Ask kitchen staff to provide a list of all food choices to be served on the day of the audit so that you can prepare proper signage and the number of buckets. Items such as reusable trays and silver ware may return to the kitchen staff at a slower pace than normal during the tray audit days, as some of these items must be counted and recorded before being returned for washing. If applicable, explain that any unopened, uneaten, packaged items placed on a Share Table during the days of the audit must be counted and recorded before being sanitized or redistributed back into the meal program.

### Select the right date

The dates you choose to conduct a tray audit should not coincide with non-routine events. For example, if a large number of students are out on a field trip and are not eating lunch at school, this is not a good day to conduct a tray audit. Speak with your food service manager to ensure that the meal served on the date chosen for the tray audit is a part of the school's regular meal schedule. Future tray audits should be conducted on days where the same meal is served.

### Work with your custodial staff

Let your custodial staff know about the tray audits so that they can prepare properly, recommend a space to place your tray audit sorting line and assist you during the audit by emptying large organics,

recycling, and trash bins. If your audit will occur over multiple days, ensure to pick a location where tables, tarps and buckets can stay overnight. Make sure that staff know what is being measured so they do not accidentally dispose of something.

### **Recruit volunteers**

Volunteers will be needed the day of the tray audit to help sort student tray waste, weigh it, and record the results. Typically, tray audits need at least 3-4 food sorter volunteers and 2-3 interviewer volunteers depending on the size of the lunch period. School Green Teams, student councils, PTO volunteers, and Dakota County Master Recycler Composter volunteers are good places to start recruiting volunteers. Tray audits typically take place during all periods of a meal service, plus time for set up and clean up.

### **Make an announcement**

Before the audit begins, it is helpful to prepare students for what to expect. Include a message during the morning announcements or in classrooms to let students know that the cafeteria will look different the day of the audit. Explain that they may be asked questions about their leftovers and their food will be sorted by volunteers. Make it clear that they are not in trouble for not finishing their food that day—explain that the goal is just to collect information to reduce food waste. Tell lunchroom monitors or teachers the plan so they can help steer students in the right direction.

## **Step 2: Set up the audit station**

### **Gather the following materials prior to the day of the audit**

- Two 32 gallon organics bins to empty food buckets (if applicable)
- Two 32 gallon recycling bins
- Two 32 gallon trash bins
- Large organics, trash, and recycling bags
- Small bags for buckets (certified-compostable if school has organics)
- 2-5 tables
- 10-20 5gallon buckets
- Scale
- Signage and stand directing students to tray audit station (if needed)
- Labels with images of specific food items
- Cleanup supplies such as cleaning spray, rags, mops, and brooms
- Student interview sheets:
  - Paper student record sheet, clipboards, and pens
  - OR
  - Online form, such as a Google Form, and iPads
- Weight log sheets and clipboards
- Gloves
- Aprons
- First aid kit
- Tarps
- Tape for bucket signs
- Markers
- Extra paper
- Camera
- Stopwatch or phone (optional)



### Prepare the audit station an hour before the first meal period

- Set up 2 or 3 long tables in a line
- Place a tarp on top of the tables for easy clean up
- Place buckets on top of the tables. Label each bucket for each item being served that day. We suggest the following order for your buckets, but you may find a better flow once you get started:
  - Whole, unopened, packaged items like unopened milk cartons. These can go in a bucket or on a section of the table to be counted later.
  - Milk
  - Entrée(s), such as hamburgers-each entrée needs its own bucket
  - Sides, such as baked beans or a bread roll-each side needs its own bucket
  - Fruits and vegetables– each fruit and vegetable type needs its own bucket
- Line buckets for messy foods with small bags for easy clean up. Use certified-compostable bags if your school collects organics.
- A tray audit does not count banana peels, apple cores, napkins or other items that cannot be eaten. Set up separate buckets to collect:
  - Organics for food scraps that cannot be eaten (like apple cores) and napkins if your school collects organics. If not, this goes in the trash bucket
  - Recycling for empty milk cartons and other recyclables, and
  - Trash for wrappers or other items.
- Place a scale at the end of the line of buckets.
- Weigh an empty bucket and record on your weight record log so you know what to subtract from your weight of a bucket filled with food later.
- Have a rag and mop ready if any spills occur.





### □ Train your volunteers

Ensure all volunteers are familiar with their roles and all volunteers who will be handling food are wearing an apron and gloves before students approach the audit station. Tray audits are fun, but can be hectic and fast paced. Assign volunteers to specific tasks to reduce confusion. For example, one person may be in charge of directing students to the interview and audit stations. A few people may be assigned to interview students. In the sorting line, each person may have a different task depending on their location in the sorting line, like taking off non-food items like wrappers or emptying milk cartons into the bucket labeled for wasted milk.

## STEP 3: CONDUCT THE TRAY AUDIT

### □ Direct students to the audit station

When students are done eating their meal, direct them to be interviewed by an audit volunteer. Have 2-3 interview volunteers ready depending on the size of the lunch period.

### □ Interview students

A volunteer will ask the student what is left on their tray and why they weren't able to finish it. Encourage thoughtful answers from students without putting words in their mouths. A student being interviewed simply saying "I didn't like it" isn't as helpful, so follow up with a question of "Why?" or "What could have been better"? Record answers for later analysis on the interview log.

It may not be possible to interview every student-that's ok. All students will have their food sorted into buckets, so focus on interviewing as many students as time allows.



### □ Sort

After being interviewed, interview volunteers will direct students to drop their trays off at the beginning of the sorting audit station. It is helpful to have extra table space before the bucket line to allow for multiple trays to be placed down in case sorting volunteers get backed up.

Here is a suggested sorting process:

1. Place trays that had no leftovers into one pile and do not pass them down the sorting line to keep this count separate. You may remove napkins and inedible foods like apple cores from the trays before stacking.
2. Remove unopened, packaged foods or whole, uneaten fruit off the tray and place in a designated area.
3. Gather opened milk cartons and pour leftover milk into the first bucket. Put empty cartons in a recycling bucket nearby.



4. Take off wrappers, napkins, inedible foods (e.g. apple cores, banana peels) and sort them into trash and organics buckets nearby.
5. Pass trays with leftovers down the sorting line until everything is sorted into buckets. It is best if each volunteer has the responsibility to sort specific items so that trays can be passed down the tray line quickly.
6. Stack all trays at the end of the line to be counted after the lunch period as trays with wasted food.

### Take pictures

Take pictures throughout the sorting process to record and document anything interesting.

## Step 4: Record data

### Weigh buckets

Have one volunteer in charge of recording weights from the scale after each lunch period on a recording log while other volunteers gather buckets, put them on the scale, and then empty buckets in large collection bins. Make sure to note the food item for the corresponding bucket weight. You will subtract the weight of the bucket later.

If a bucket comes close to full in the middle of a lunch period, weigh the bucket and record before emptying it. Only allow liquid buckets to get half full to prevent spills.

### Track unopened items

Record how many unopened, uneaten, packaged items were collected on the weight record log. These items include unopened milk, uneaten fruit, packaged carrots and yogurt.

If your school uses a Share Table (or other model for unopened items), you can also record how many unopened items get placed on the Share Table during the audit compared to how many unopened items come to the audit station. This will help you understand if students are using the Share Table properly.

### Measure back of house wasted food

Coordinate with your school's kitchen staff to record the weight of unserved edible food if possible. Ask questions on what is done with extra prepared foods (e.g., donation).

### Count trays

Record the number of trays that did not have leftovers (from the separate pile at the beginning of the sorting line) and the number of trays that had food waste separately. The total number of trays



collected with and without leftovers represents the number of students who ate school lunch that day. These tray counts are kept separate so you have the total number of students without wasted food in addition to those with wasted food.

### Step 5: Clean up

Have a rag and mop available to clean up any spills. Dispose of collected materials as appropriate and wipe down tarps and tables. Schools often have a mop room where buckets can be brought for easy cleaning. Thank the volunteers and staff.

If you're doing a tray audit for multiple consecutive days, ask lunch room and facilities staff to leave the tables, tarps and containers where they are.

### Step 6: Analyze data

Analyze the data you collected and determine the best ways to address wasted food in your school. Some of the ways you can analyze your data:

#### Get weights of food

Subtract the weight of the empty bucket from the weights of the buckets filled with wasted food. These are your final wasted food weights by food item.

It's helpful to group weights of similar food items together, such as adding all weights of fruits collected together and all weights of vegetables together. This will give you a better idea of what category of food is being wasted the most.

For example, Table A details the weight off all food items collected in Kindergarten and 1<sup>st</sup> Grade.

Table B combines the weights of food categories together. Table B represents the same data shown in Table A.

Date	Food item	GRADE			
		K		1	
5/6/2019		With bucket (lbs.)	Without bucket (lbs.)	With bucket (lbs.)	Without bucket (lbs.)
	Teriyaki Chicken	5.4	3.2	4.4	2.2
	PB+J	2.6	0.4	2.4	0.2
	Fried Rice	3.6	1.4	3.6	1.4
	Fortune Cookie	2.2	0	2.4	0.2
	Salad	2.4	0.2	3	0.8
	Carrots	2.6	0.4	3.2	1
	Broccoli	3	0.8	3	0.8
	Canned Fruit	3.2	1	2.8	0.6
	Apples	3.6	1.4	4.4	2.2
	Milk	15.2	13	9.4	7.2
	<b>Total</b>		<b>21.8</b>		<b>16.6</b>

Date		GRADE			
5/6/2019	Food category	K		1	
		With bucket (lbs.)	Without bucket (lbs.)	With bucket (lbs.)	Without bucket (lbs.)
	Entrees		3.6		2.4
	Sides		1.4		1.6
	Vegetables		1.4		2.6
	Fruit		2.4		2.8
	Milk		13		7.2
	<b>Total</b>		<b>21.8</b>		<b>16.6</b>

### Calculate the weight of wasted food per student

Dividing the total weight of food collected by the number of students served will give you the weight of food wasted per student. You can multiply this number by the number of students and the number of school days in a year to approximate how much food is wasted every year. This is a powerful way to communicate your school's wasted food impact.

#### **Example:**

30 pounds of milk of was collected during one day of tray audits

300 students had school lunch that day and participated in the tray audit

There are 180 days of school in a year

30lbs wasted milk/300 students = 0.1lbs of wasted milk per student

0.1lbs of wasted milk per student \* 300 students\* 180 school days = 5,400lbs of wasted milk for the school per school year

### Review audit interview responses

Common responses from the interview portion of the audit can be a good starting point for solutions to reducing wasted food in your school. Group common answers together such as "Not enough time" or "I was full".

### Report results

Share the results of the tray audit with everyone that was involved in the process in addition to management, administrators, and peers. If you have the ability to compile a brief report on your findings with pictures, this will assist in communicating the needs for next steps.

## Step 7: Implement food waste reduction strategies

Based on your tray audit results, implement strategies to reduce wasted food in your school. See Dakota County's wasted food prevention best practices guide for strategy ideas.

## Step 8: Consider a future tray audit

### Percent Change

$$\text{Percent Change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100\%$$

If the result is positive, it is an increase.  
If the result is negative, it is a decrease.

After implementing wasted food prevention strategies over several months, measure the success of the implemented strategies in reducing wasted food by leading another tray audit measuring the same meal served as the original audit. Compare the results of your pre- and post-audits to track your success. Compare your pre- and post- audits by using the percent change formula.

### Example:

Pre-Project Wasted Milk per student per day: 0.10lbs per student

Post-Project Wasted Milk per student per day: 0.05lbs per student

$((\text{Post-project weight} - \text{Pre-project weight}) / (\text{pre-project weight})) * 100\% = \text{Percent Change}$

$(0.05/0.10)/0.10 = 50\%$  decrease in wasted milk per student

# Appendix B: Garlough Elementary School Pre-Project Tray Audit Results

## Wasted Food Prevention Project Pre-Project Tray Audit Report

**School Name:** Garlough Environmental Magnet School

**Location:** West St. Paul, MN

**Audit Dates:** Feb. 1, 4, 7 and 8

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at Garlough School on February 1, 4, 7 and 8 measured the amount of food served to students but not eaten prior to any changes aimed to reduce wasted food were made. Another round of audits will be completed in the spring of 2019 to track progress.

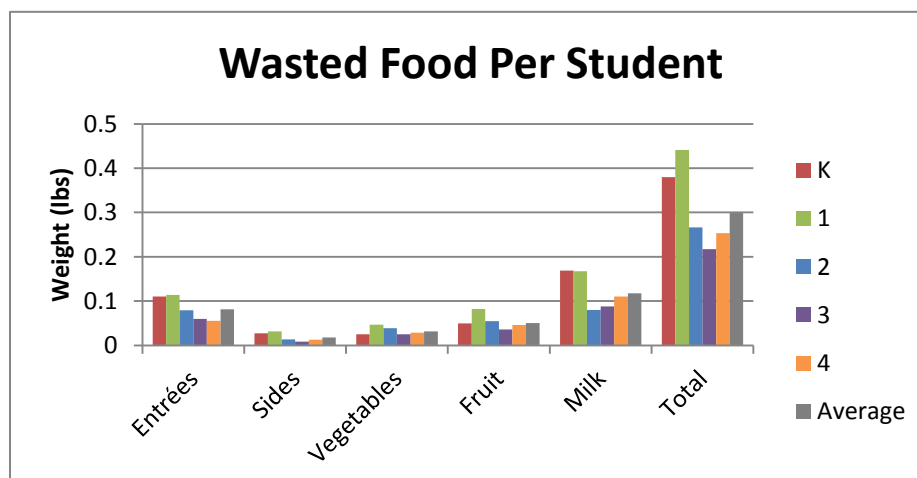
Date	Trays audited	lbs. of wasted food collected
Feb. 1	299	87.8
Feb. 4	321	90.8
Feb. 7	309	100.8
Feb. 8	268	78.6
<b>Total</b>	<b>1197</b>	<b>358</b>

### Tray Audit Findings

The following findings are based on the combined collected data from February 1, 4, 7 and 8. Data and graphs can be provided by day, by specific menu items, and by grade level upon request. **On average, 299 trays were sorted and 89.5 pounds of wasted food were collected each day.** All school lunches were sorted and weighed and more than one half of all students were interviewed each day. Students who brought lunch from home are not included in these findings.

#### By Student

- **79% of all students audited wasted food.** Generally, younger students were more likely to have leftover food than older students.
  - 85% of audited kindergarteners had wasted food on their tray
  - 88% of audited 1<sup>st</sup> graders had wasted food on their tray
  - 80% of audited 2<sup>nd</sup> graders had wasted food on their tray
  - 69% of audited 3<sup>rd</sup> graders had wasted food on their tray
  - 72% of audited 4<sup>th</sup> graders had wasted food on their tray
- **The average student wasted 0.30 pounds of food per day.** If 300 students generate this per day, this equals 450 pounds wasted food generated every school week. Out of all grades, 1<sup>st</sup> graders wasted the most food at 0.44 pounds per student per day.
- The kitchen tossed 3.4% of all entrée servings (35 servings), 6.4% of all fruit and vegetable servings (106 servings), and 2.1% of all grain/bread servings (17 servings) offered.
- 526 interview responses (42%) indicated they **did not have enough time to eat**
- 234 interview responses (19%) indicated being **too full or that the portion size was too big** to finish.
  - On Feb. 7, **21% of students** (65 students) did not finish **one half or more** of their sandwich.

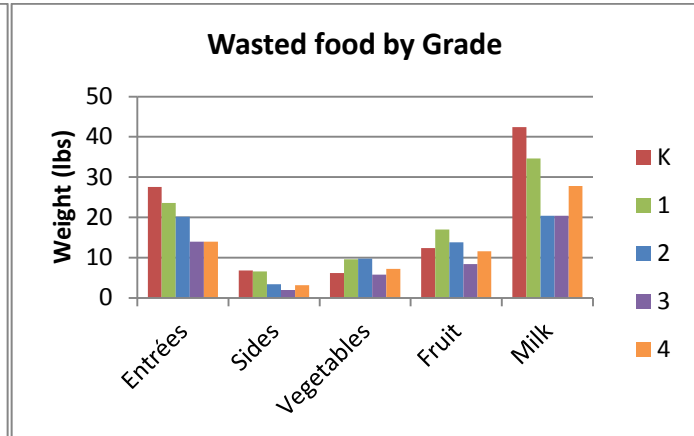
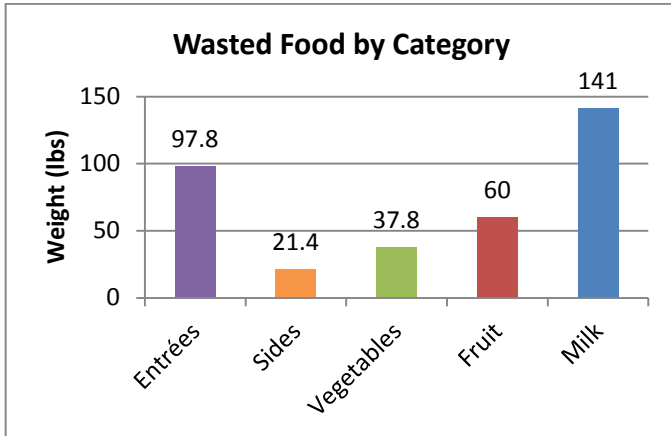


## By Food Category

Milk, fruit, and entrees were the most wasted food categories by weight.

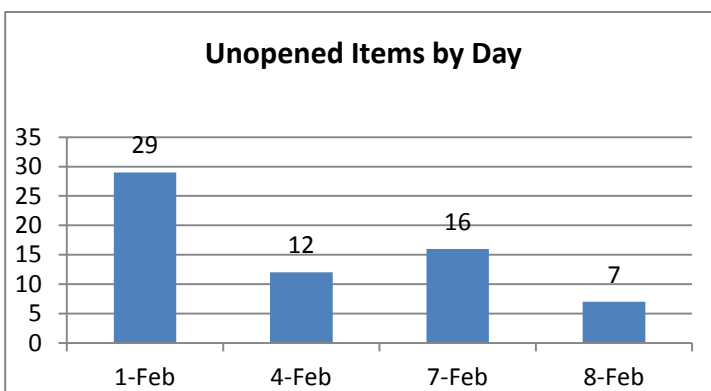
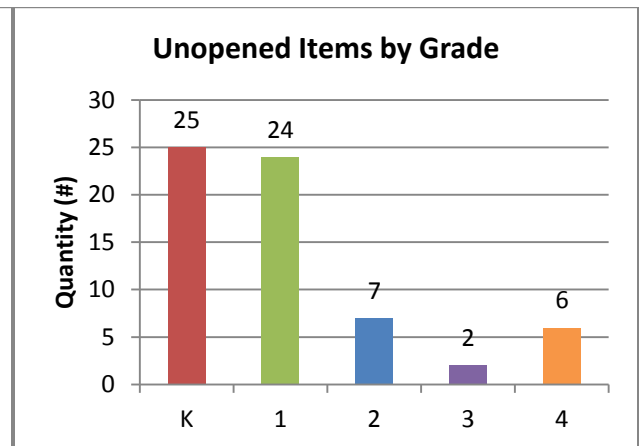
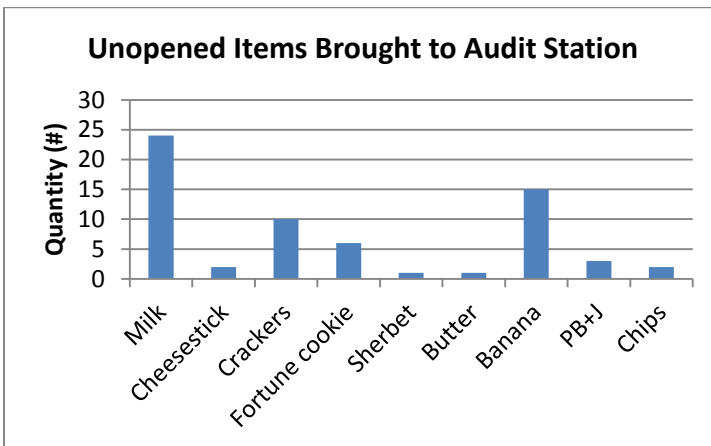
### Food Category Groupings

- Entrees: Chicken Patty & Bun, PB+J, Grilled Cheese, Ham & Cheese Sandwich, Tomato Soup, Chicken Noodle Soup, Teriyaki Chicken, Pizza (27% of all wasted food by students)
- Sides: Cheese Sticks, Chips, Taco Meat, Crackers, Rice, Fortune Cookie, Potato Salad, Sherbet Cup (6% of all wasted food by students)
- Vegetables: Salad, Raw Broccoli, Cooked Broccoli, Celery, Carrots, Tomato, Lettuce, Cucumbers, Pea Pods, Jicama (11% of all wasted food by students)
- Fruit: Apples, Oranges, Pears, Bananas, Kiwi, Peaches, Pineapple, Mandarin oranges (17% of all wasted food by students)
- Milk: (39% of all wasted food by students)



## Unopened Items

Over the course of four days, no items were placed on the share table and **64 items** (an average of 16 per day) were eligible to be shared but were brought to the audit station. The most common eligible item not placed on the Share Table was **unopened milk cartons**.



\*Note: Friday, Feb 1 was the first day of school after four consecutive snow days. While normally only served at breakfast, bananas were served at lunch on this day to use them before they spoiled. About half of the kindergarten and 1<sup>st</sup> grade unopened items came from Friday, Feb. 1. Please note this when observing the graphs regarding unopened items.

## Recommendations

### ISSUE: Time to eat

- Continue 30 minute lunch periods. Extending lunch from 20 to 30 minutes reduces plate waste by nearly one-third.
- Ensure all students have some form of physical activity before lunch and don't feel pressured to leave lunch early. Holding recess before lunch can increase vegetable and fruit consumption by 54%.
- Have cafeteria monitors or other staff prompt students when to start or finish eating certain items (e.g. sides).
- Consider dimming the lights and requesting quiet during the last five minutes of each lunch period to refocus students' attention on finishing their meal.

### ISSUE: Students full

- Reduce portion sizes where relevant and/or offer half portions. Provide smaller sized scoops for fruit and salad bar.
- Slice whole fruits such as apples, oranges, and pears, especially for younger students. Offering sliced fruit can increase student consumption by over 70%.
- Pair raw vegetables with low-fat dips such as hummus or ranch.

### ISSUE: Uneaten food going to waste

- Educate students on audit results in I-Nature class. Provide an opportunity for feedback.
- Implement a Share Table
  - Locate away from sorting station, preferably after the point of sale. Consider using a rolling cart for the Share Table for ease of transportation.
  - Clearly label the Share Table with rules and pictures of eligible items.
  - Educate students (particularly younger students) on how to use the Share Table and its purpose.
  - Designate a staff member to clear and sanitize items for re-sale at the end of each lunch. Establish clear guidelines for staff on the process of re-sale and what to do with non-eligible items.
- Educate students on reimbursable meal requirements (not required to take milk).
- Consider switching cartons for a milk dispenser.
- Provide beverage options other than milk. Encourage use of water fill stations or provide bulk water station.
- Consider distributing kitchen leftovers that would otherwise be tossed (fruits & vegetables) to students and staff. Continue recording what is thrown away or frozen and repurposed on kitchen production logs. Consider using [USDA approved Nutrient Analysis Software](#) for menu planning.

### ISSUE: Lack of student engagement in cafeteria

- Display a menu board with the day's meal options with creative names readable from 5 feet away when approaching service area. Display a menu board for tomorrow's meals with creative names.
- Display labels for all items along the food service line with creative, descriptive names.
- Identify one fruit and one vegetable as the featured fruit and vegetable of the day at the point of selection.
- Involve students in:
  - Daily menu announcements
  - The development of creative and descriptive menu item names.
  - Artwork creation or marketing materials for menu items.
  - Feedback opportunities to inform menu development.
- Provide accurate images of all food items on website [MealViewer](#).
- Allow students to customize their meal by providing a "Flavor Station" and limit pre-portioned condiments. Consider a condiment caddy.
- Market your meals
  - Taste tests with students (i.e., try-day Friday, vote for your favorite).
  - School Garden highlights
  - One last sip/bite campaign. (Example: [Sioux Trail Elementary](#))



## Resources

- [MN Department of Education](#) Food Safety Resources
  - Share tables: Guidelines and resources
- [Register for Smarter Lunchrooms Movement](#)
- [Smarter Lunchrooms: Creative, Fun, and Descriptive Names](#)
- [Smarter Lunchrooms: Printable signs and labels](#)
- [Smarter Lunchrooms: Flavor station guidance](#)
- [FuelUp to Play 60 Grants](#)
  - Deadline: Wednesday April 10, 2019
- [AGRI Farm to School Grants](#)
- [Action for Healthy Kids Grants](#)
  - Deadline: Friday, April 5, 2019



Thank you for your participation and your future efforts to reduce wasted food!

# Appendix C: Gideon Pond Elementary School Pre-Project Tray Audit Results

## Wasted Food Prevention Project Pre-Project Tray Audit Report

**School Name:** Gideon Pond Elementary School

**Location:** Burnsville, MN

**Audit Dates:** Jan. 11 and 14

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at Gideon Pond on January 11 and 14 measured the amount of food served to students but not eaten prior to any changes aimed to reduce wasted food were made. Another round of audits will be completed in the spring of 2019 to track progress.

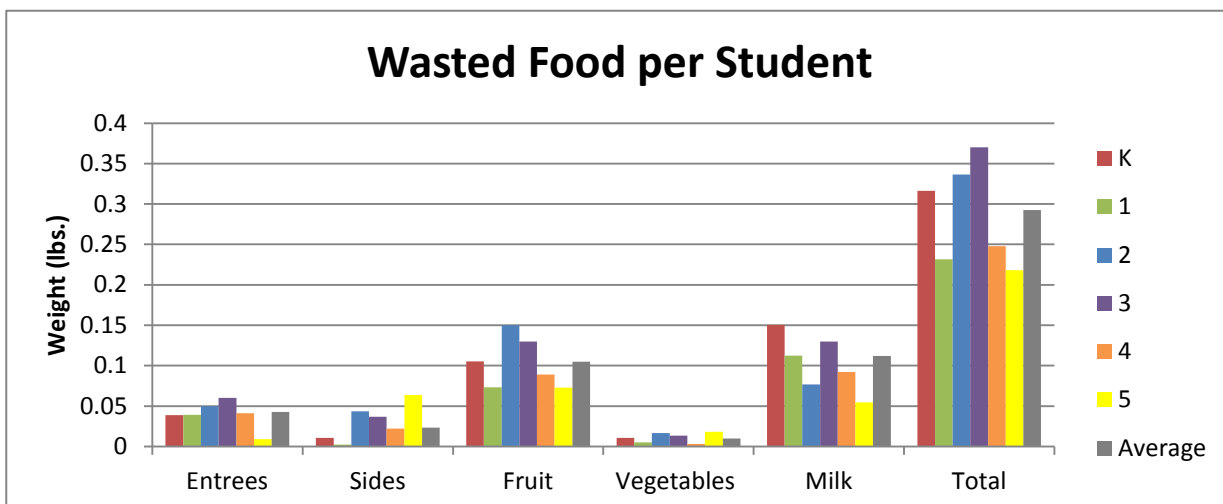
Date	Trays audited	lbs. of wasted food collected
Jan. 11	197	59.6
Jan 14	183	51.6
<b>Total</b>	<b>380</b>	<b>111.2</b>

### Tray Audit Findings

The following findings are based on the combined collected data from January 11 and 14. Data and graphs can be provided by day, by specific menu items, and by grade level upon request. **Approximately half of students had their leftovers sorted and were interviewed.** For analysis, it is assumed in this report that Gideon Pond’s cafeteria served 400 students each day and each student produced 0.29 pounds of wasted food. Students who brought lunch from home are not included in these findings.

#### By Student

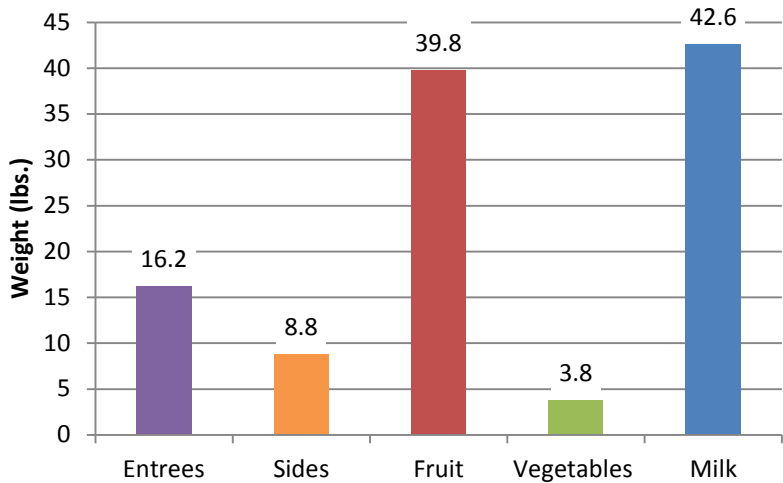
- **83% of all students audited wasted food.**
  - 89% of audited kindergarteners had wasted food on their tray
  - 83% of audited 1<sup>st</sup> graders had wasted food on their tray
  - 78% of audited 2<sup>nd</sup> graders had wasted food on their tray
  - 86% of audited 3<sup>rd</sup> graders had wasted food on their tray
  - 75% of audited 4<sup>th</sup> graders had wasted food on their tray
  - 86% of audited 5<sup>th</sup> graders had wasted food on their tray
- **The average student wasted 0.29 pounds of food per day.** This equals 580 pounds of wasted food generated every week. Out of all grades, 3<sup>rd</sup> graders wasted the most food at 0.37 pounds per student per day.
- **Edible kitchen waste totaled 23.5 pounds** over the two audit days. Kitchen waste accounted for approximately **9% of all wasted food** generated over the two days.
- **38%** (157 responses) of all interview responses indicated they **did not have enough time to eat**
- **10%** (44 responses) of all interview responses indicated being **too full or that the portion size was too big** to finish



## By Food Category

Milk, fruit, and entrees were the most wasted food categories by weight.

### Wasted Food by Category



#### Food Category Groupings

Entrees: Chicken Patty, PB+J, Salad, Chicken nuggets, orange chicken, 1/2 turkey sandwich (**15% of all wasted food by students**)

Sides: Asian Rice, Potatoes, Cookies, Yogurt (**8% of all wasted food by students**)

Fruit: Apples, Applesauce, Grapes, Oranges, Strawberry Cup, Pears, Mixed Fruit Cup (**36% of all wasted food by students**)

Vegetables: Broccoli, Carrots, Tomatoes, Lettuce (**3% of all wasted food by students**)

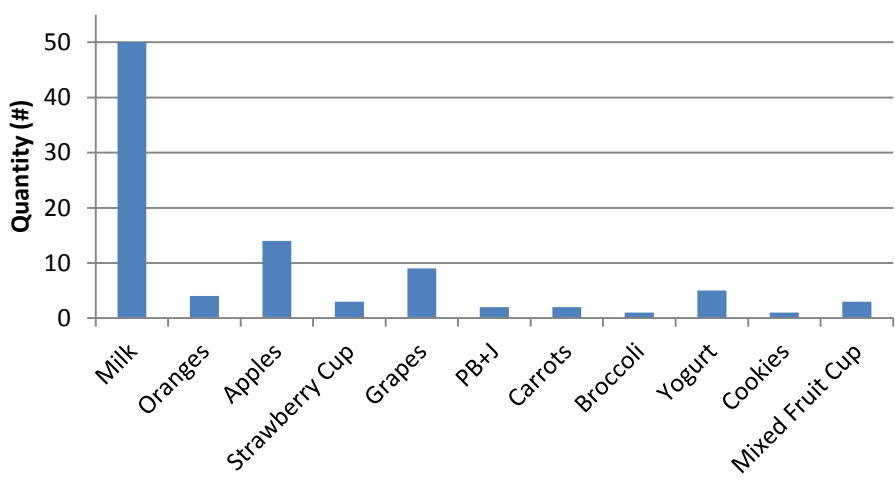
Milk: (**38% of all wasted food by students**)

## Unopened Items

Over the course of 2 days, **94 items** were eligible to be placed on the Drop Zone table but were brought to the audit station. That's approximately **1 unopened item for every 4 students**.

The most common eligible item not placed on the Drop Zone table was **unopened milk cartons**.

### Unopened Items Brought to Audit Station



## Recommendations

### ISSUE: Time to eat

- Extend lunch periods so students have more time to eat and socialize. Extending lunch periods from 20 to 30 minutes reduces plate waste by nearly one-third.
- Ensure all students have some form of physical activity before lunch and don't feel pressured to leave lunch early. Holding recess before lunch can increase vegetable and fruit consumption by 54%.
- Have cafeteria monitors or other staff prompt younger students when to start or finish eating certain items (e.g. sides).

### ISSUE: Students full

- Reduce portion sizes where relevant and/or offer half portions. Provide smaller sized scoops for self-serve fruit and salad bar options.
- Slice whole fruits such as apples, oranges, and pears, especially for younger students. Offering sliced fruit can increase student consumption by over 70%.
- Pair raw vegetables with low-fat dips such as hummus or ranch.

### ISSUE: Uneaten food going to waste

- Improve Drop Zone
  - Continue locating the Drop Zone away from the sorting station
  - Clearly label it with rules and pictures of eligible items.
  - Educate students on how to use the Drop Zone and its purpose.
  - Designate a staff member to clear and sanitize items for re-sale at the end of each lunch.
  - Establish clear guidelines for staff on the process of re-sale and what to do with non-eligible items.
- Educate students on reimbursable meal requirements (not required to take milk).
- Consider switching cartons for a milk dispenser.
- Provide beverage options other than milk. Encourage use of water fill stations or provide bulk water station.
- Continue recording what is frozen or repurposed for later use in production logs.

### ISSUE: Lack of student engagement in cafeteria

- Display a menu board with the day's meal options with creative names readable from 5 feet away when approaching service area. Display a menu board for tomorrow's meals with creative names.
- Display labels for all items along the food service line with creative, descriptive names.
- Identify one fruit and one vegetable as featured fruit and vegetable of the day at point of selection.
- Involve students
  - Announce menu in daily announcements.
  - Involve students in development of creative and descriptive menu item names.
  - Involve students in creation of artwork or marketing materials for menu items.
  - Provide feedback opportunities to inform menu development.
- Provide accurate images of all food items on website [Nutrislice](#).
- Allow students to customize their meal by providing a "Flavor Station" and limit pre-portioned condiments. Consider a condiment caddy.
- Market your meals
  - Taste tests with students (i.e., try-day Friday, vote for your favorite).
  - School Garden highlights
  - One last sip/bite campaign
    - Example: [Sioux Trail Elementary](#)

## Resources

- [MN Department of Education](#) Food Safety Resources
  - Share tables: Guidelines and resources
- [Register for Smarter Lunchrooms Movement](#)
- [Smarter Lunchrooms: Creative, Fun, and Descriptive Names](#)
- [Smarter Lunchrooms: Printable signs and labels](#)
- [Smarter Lunchrooms: Flavor station guidance](#)
- [FuelUp to Play 60 Grants](#)
  - [Deadline: Wednesday April 10, 2019](#)
- [AGRI Farm to School Grants](#)



Thank you for your participation and your future efforts to reduce wasted food!

# Appendix D: Heritage Middle School Pre-Project Tray Audit Results

## Wasted Food Prevention Project Pre-Project Tray Audit Report

**School Name:** Heritage E-STEM Magnet Middle School  
**Location:** West St. Paul, MN  
**Audit Dates:** Feb. 14 & 15

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at Heritage Middle School on February 14 and 15 measured the amount of food served to students but not eaten prior to any changes aimed to reduce wasted food were made. Another round of audits will be completed in the spring of 2019 to track progress.

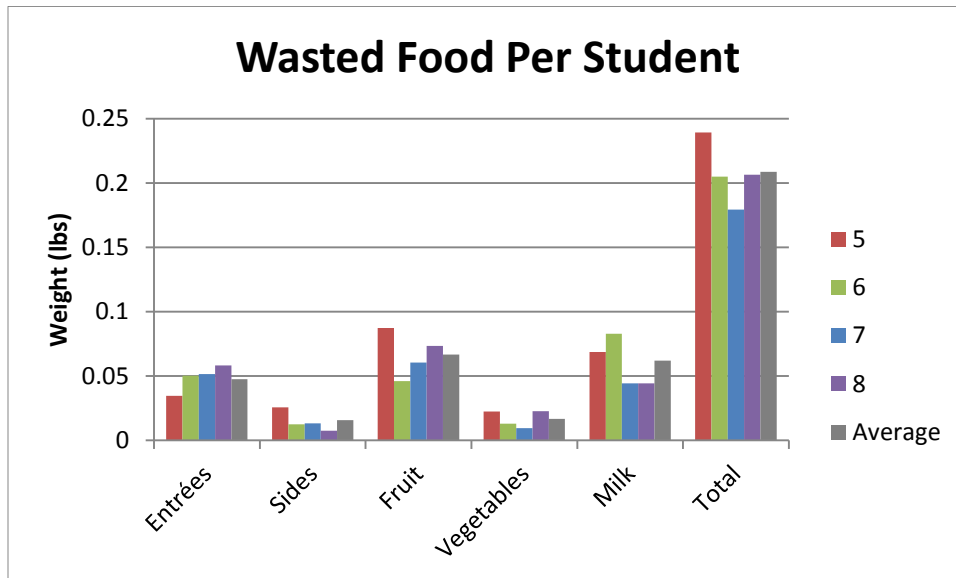
Date	Trays audited	lbs. of wasted food collected
Feb. 14	523	124.6
Feb. 15	534	96
<b>Total</b>	<b>1057 trays</b>	<b>220.6 lbs.</b>

### Tray Audit Findings

The following findings are based on the combined collected data from February 14 and 15. Data and graphs can be provided by day, by specific menu items, and by grade level upon request. **On average, 529 trays were sorted, 110 pounds of wasted food were collected and 350 interview responses were recorded each day.** All school lunches were sorted and weighed. Students who brought lunch from home are not included in these findings.

#### By Student

- **71% of all students audited wasted food.**
  - 73% of audited 5<sup>th</sup> graders had wasted food on their tray
  - 65% of audited 6<sup>th</sup> graders had wasted food on their tray
  - 76% of audited 7<sup>th</sup> graders had wasted food on their tray
  - 73% of audited 8<sup>th</sup> graders had wasted food on their tray
- **The average student wasted 0.21 pounds of food per day.** If 525 students generate this per day, this equals about 550 pounds of wasted food generated every school week. Out of all grades, 5<sup>th</sup> graders wasted the most food at an average of 0.24 pounds per student per day.
- 318 interview responses (45%) indicated being **too full or not hungry**
- 22% of respondents who didn't finish their milk (8 students) indicated they **had to take it**

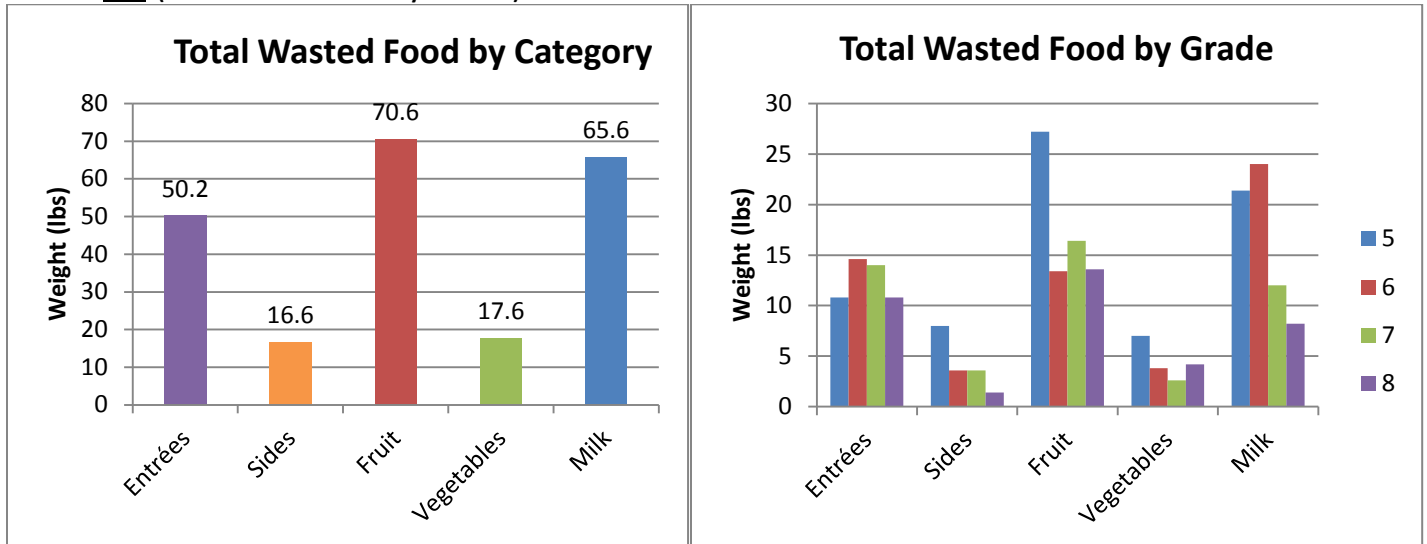


## By Food Category

**Milk, fruit, and entrées were the most wasted food categories by weight.** The graphs below represent the total wasted food generated over the two day audit period.

### Food Category Groupings

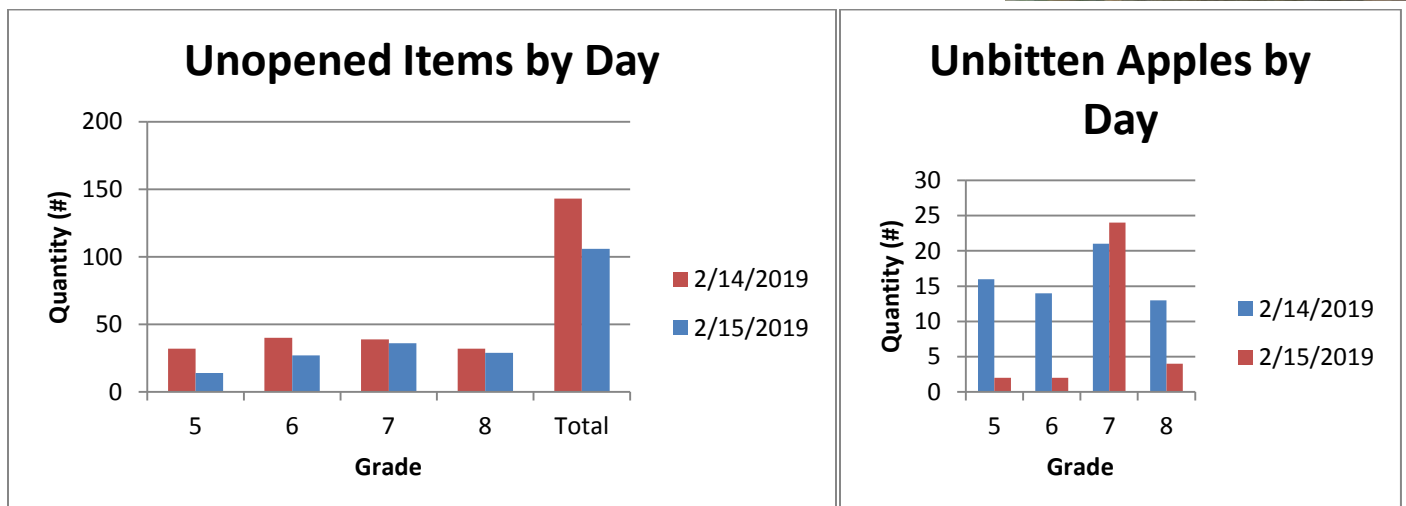
- **Entrées:** Italian dunkers, Grilled chicken sandwich, PB+J, Veggie burger, Sub sandwich, Sloppy joe, Bacon cheeseburger, Ham & cheese sandwich, Caesar wrap (22.5% of all wasted food by students)
- **Sides:** Pasta salad, Baked beans, Chips (7.5% of all wasted food by students)
- **Vegetables:** Salad, Cooked mixed vegetables, Carrots (8% of all wasted food by students)
- **Fruit:** Apples, Cantaloupe, Bananas, Oranges, Peach cups, Canned fruit (32% of all wasted food by students)
- **Milk:** (30% of all wasted food by students)



## Unopened Items

Over the course of two days, **249 items** (an average of 1 item for every 4 students audited per day) were eligible to be shared but were brought to the audit station. The most common items not placed on the Share Table were unbitten apples and unopened milk cartons.

*\*Items recorded as unopened include: apples, oranges, Craisins, raisins, carrot bags, cheese sticks, milk, ham and cheese sandwiches in clamshells, Caesar wraps in clamshells, Caesar salads in clamshells, dressing packets, peach cups, sealed PB+Js, and chip bags.*



## Recommendations

### ISSUE: Time to eat

- Extend lunch periods. Extending lunch periods from 20 to 30 minutes reduces plate waste by nearly one-third.
- Ensure all students have some form of physical activity before lunch and don't feel pressured to leave lunch early. Holding recess before lunch can increase vegetable and fruit consumption by 54%.
- Have cafeteria monitors or other staff prompt students when to start or finish eating certain items (e.g. sides).
- Consider dimming the lights and requesting quiet during the last five minutes of each lunch period to refocus students' attention on finishing their meal.

### ISSUE: Students full

- Reduce portion sizes where relevant and/or offer half portions. Provide smaller sized scoops for fruit and salad bar.
- Prevent kitchen prep waste by having students report meal choices each morning. Allow half portion requests.
- Slice whole fruits such as apples, oranges, and pears, especially for younger students. Offering sliced fruit can increase student consumption by over 70%.
- Consider providing self-serve fruit portions instead of pre-portioned fruit cups. Allow dipping sauces and sides (such as the sauce for the Italian dunkers) to be self-serve portions.

### ISSUE: Uneaten food going to waste

- Implement a Share Table
  - Locate away from sorting station, preferably after the point of sale. Clearly label the Share Table with rules and pictures of eligible items. Educate students on how to use the Share Table and its purpose.
  - Consider implementing a rolling cart Share Table in the classroom breakfast areas. Conduct a breakfast audit to measure the effectiveness of a breakfast Share Table.
  - Designate a staff member to clear and sanitize items for re-sale at the end of each lunch. Establish clear guidelines for staff on the process of re-sale and what to do with non-eligible items.
- Educate students on reimbursable meal requirements (not required to take milk).
- Consider switching cartons for a milk dispenser.
- Provide beverage options other than milk. Encourage use of water fill stations or provide a bulk water station.
- Consider distributing kitchen leftovers that would otherwise be tossed (fruits & vegetables) to students and staff. Consider using [USDA approved Nutrient Analysis Software](#) for menu planning.
- Consider having grab and go meals de-packed and in assembly line format.

### ISSUE: Lack of student engagement in cafeteria

- Display a menu board with the day's meal options with creative names readable from 5 feet away when approaching service area. Display a menu board for tomorrow's meals with creative names.
- Display labels for all items along the food service line with creative, descriptive names.
- Identify one fruit and one vegetable as the featured fruit and vegetable of the day at the point of selection.
- Involve students in:
  - Daily menu announcements
  - The development of creative and descriptive menu item names.
  - Artwork creation or marketing materials for menu items.
  - Feedback opportunities to inform menu development.
- Provide accurate images of all food items on website [MealViewer](#).
- Allow students to customize meals by providing a "Flavor Station". Label condiment station with attractive signage.
- Market your meals
  - Taste tests with students (i.e., try-day Friday, vote for your favorite).
  - School Garden highlights
  - One last sip/bite campaign (Example: [Sioux Trail Elementary](#)).



## Resources

- [MN Department of Education](#) Food Safety Resources
  - Share tables: Guidelines and resources
- [Register for Smarter Lunchrooms Movement](#)
- [Smarter Lunchrooms: Creative, Fun, and Descriptive Names](#)
- [Smarter Lunchrooms: Printable signs and labels](#)
- [Smarter Lunchrooms: Flavor station guidance](#)
- [FuelUp to Play 60 Grants](#)
  - Deadline: Wednesday April 10, 2019
- [AGRI Farm to School Grants](#)
- [Action for Healthy Kids Grants](#)
  - Deadline: Friday, April 5, 2019



Thank you for your participation and your future efforts to reduce wasted food!

# Appendix E: Pine Bend Elementary School Pre-Project Tray Audit Results

## Wasted Food Prevention Project Pre-Project Tray Audit Report

**School Name:** Pine Bend Elementary School  
**Location:** Inver Grove Heights, MN  
**Audit Dates:** Jan. 9-10, 2019

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at Pine Bend on January 9 and 10 measured the amount of food served to students but not eaten prior to any changes aimed to reduce wasted food were made. Another round of audits will be completed in the spring of 2019 to track progress.

Date	Trays audited	lbs. of wasted food collected
Jan. 9	387	109
Jan 10	335	143.2
<b>Total</b>	<b>722</b>	<b>252.2</b>

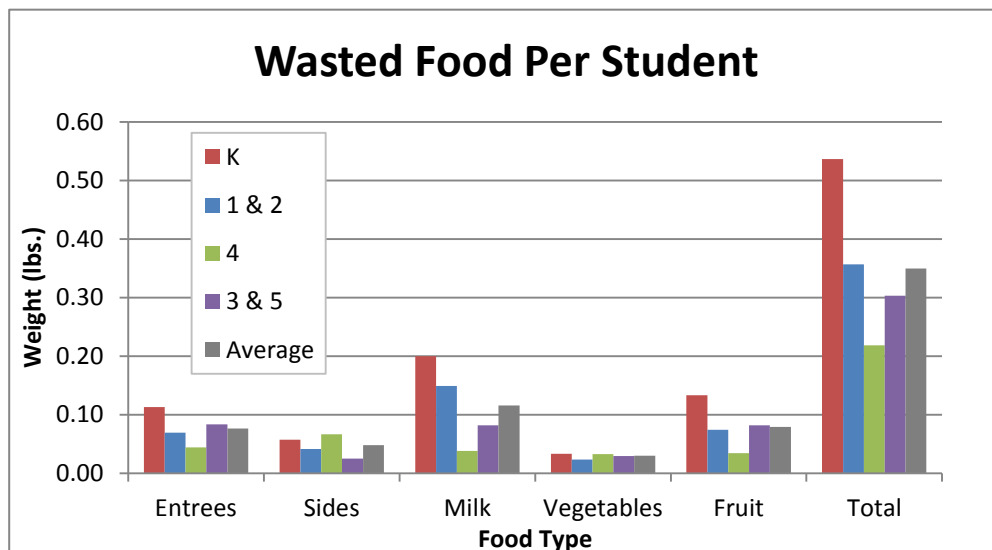
### Tray Audit Findings

The following findings are based on the combined collected data from January 9 and 10. Data and graphs can be provided by day, by specific menu items, and by grade level upon request. All students with wasted food were interviewed and all leftover food on trays was sorted. Students without any leftover food were counted.

Trays and weights were collected by each grade’s lunch period. Due to tight turnaround times between lunch periods, data from grades 1 & 2 and grades 3 & 5 are grouped together. Students who brought lunch from home were not included in these findings.

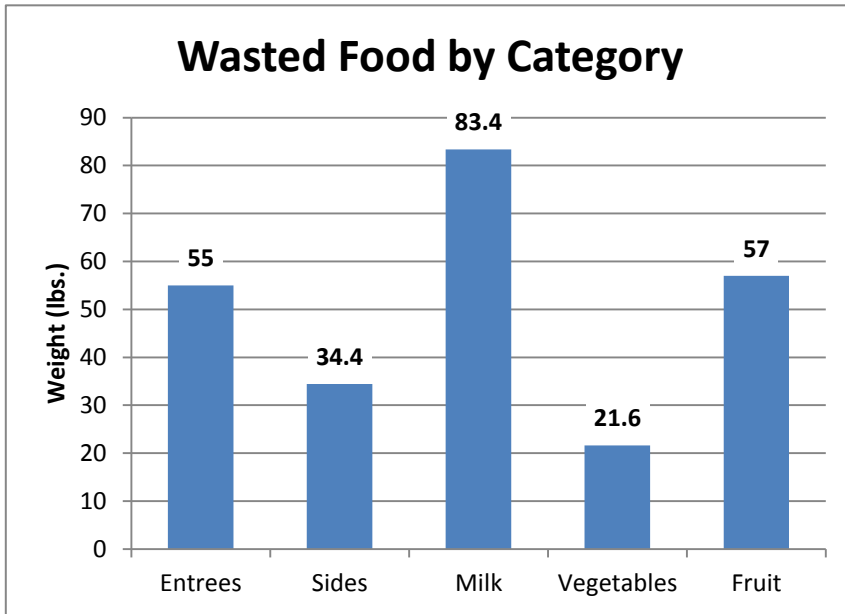
#### By Student

- **83% of all students wasted food.** Younger students were more likely to have leftover food than older students.
  - 95% of kindergarteners had wasted food on their tray
  - 84% of 1<sup>st</sup> and 2<sup>nd</sup> graders had wasted food on their tray
  - 79% of 3<sup>rd</sup> and 5<sup>th</sup> graders had wasted food on their tray
  - 74% of 4<sup>th</sup> graders had wasted food on their tray
- **The average student wasted 0.35 pounds of food per day.** Out of all grades, kindergarteners wasted the most food at 0.54 pounds per student per day.
- **248 students** over the course of two days said they **didn’t have enough time** to finish their food.
- **199 students** over the course of two days said they were **too full** to finish their food.



**By Food Category**

Milk, fruit, and entrees were the most wasted food categories by weight.



**Food Category Groupings**

Entrees: Sloppy Joe, Hot Dog, Chicken Pot Pie, Cheese Omelet  
(22% of all wasted food)

Sides: Biscuit, Potatoes, Baked Beans, Chips, Cookie (14% of all wasted food)

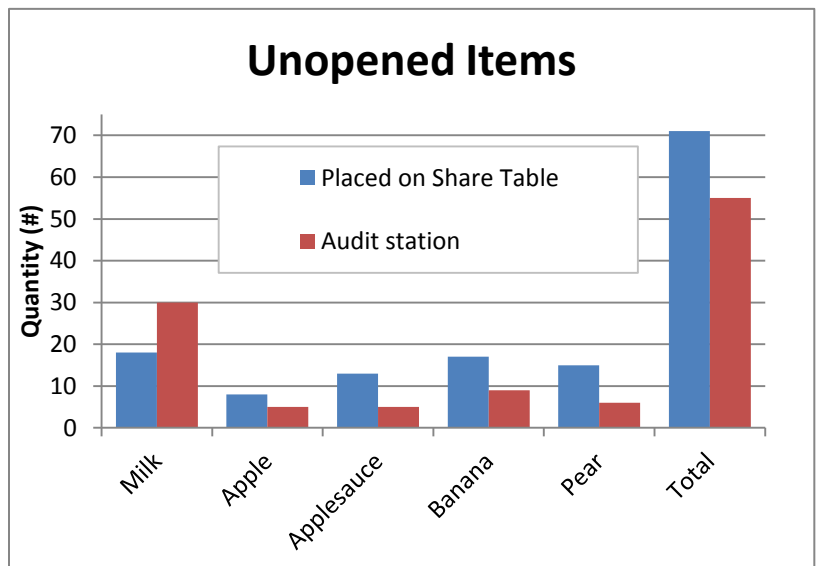
Milk: (33% of all wasted food)

Vegetables: Carrots, Cucumbers, Peas, Peppers, Celery, Salad bar, Tomatoes, Cauliflower (8.5% of all wasted food)

Fruit: Apples, Applesauce, Bananas, Mixed fruit, Pears, Watermelon, Strawberries, Pineapple, Oranges  
(22.5% of all wasted food)

**Unopened Items**

Over the course of 2 days, 126 items were eligible to be placed on the Share Table, yet **only 4 out of every 7 eligible items were actually placed on the Share Table.** The most common eligible item not placed on the Share Table was unopened milks. The most common items successfully placed on the Share Table were milks and bananas.



## Recommendations

### ISSUE: Time to eat

- Extend lunch periods so students have more time to eat and socialize. Extending lunch periods from 20 to 30 minutes reduce plate waste by nearly one-third.
- Ensure all students have some form of physical activity before lunch and don't feel pressured to leave lunch early. Holding recess before lunch can increase vegetable and fruit consumption by 54%.

### ISSUE: Students full

- Reduce portion sizes where relevant and/or offer half portions. Provide smaller sized scoops for self-serve fruit and salad bar options.
- Slice whole fruits such as apples, oranges, and pears, especially for younger students. Offering sliced fruit can increase student consumption by over 70%.
- Pair raw vegetables with low-fat dips such as hummus or ranch.

### ISSUE: Uneaten food going to waste

- Improve Share Table
  - Clearly label it with rules and pictures of eligible items.
  - Educate students on how to use the Share Table and its purpose at an assembly.
- Educate students on reimbursable meal requirements (not required to take milk) at an assembly. Consider switching cartons for a milk dispenser.
- Provide beverage options other than milk. Encourage use of water fill stations or provide bulk water station. Create poster to hang near the station to encourage drinking water.
- Educate students on audit results at an assembly.

### ISSUE: Lack of student engagement in cafeteria

- Display a menu board with the day's meal options with creative names readable from 5 feet away when approaching service area. Display a menu board for tomorrow's meals with creative names. Make use of monitor in cafeteria for this.
- Display labels for all items along the food service line with creative, descriptive names.
- Identify one fruit and one vegetable as featured fruit and vegetable of the day at point of selection.
- Involve students
  - Announce menu in daily announcements.
  - Involve in development of creative and descriptive menu item names.
  - Involve in creation of artwork or marketing materials for menu items.
  - Provide feedback to inform menu development.
- Provide images of all food items on website [Nutrislice](#).
- Allow students to customize their meal by providing a "Flavor Station" and limit pre-portioned condiments. Consider a condiment caddy.
- Market your meals
  - Taste tests with students (i.e., try-day Friday, vote for your favorite).
  - School garden food highlights.
  - One last sip/bite campaign. [Sioux Trails Elementary example](#).

## Resources

- [MN Department of Education](#) Food Safety Resources
  - Share tables: Guidelines and resources
- [Register for Smarter Lunchrooms Movement](#)
- [Smarter Lunchrooms: Creative, Fun, and Descriptive Names](#)
- [Smarter Lunchrooms: Printable signs and labels](#)
- [Smarter Lunchrooms: Flavor station guidance](#)
- [FuelUp to Play 60 Grants](#)
  - [Deadline: Wednesday April 10, 2019](#)
- [AGRI Farm to School Grants](#)



Thank you for your participation and your future efforts to reduce wasted food!

# Appendix F: School of Environmental Studies Pre-Project Tray Audit Results

## Wasted Food Prevention Project Pre-Project Tray Audit Report

**School Name:** School of Environmental Studies

**Location:** Apple Valley, MN

**Audit Dates:** March 4 & 6, 2019

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at School of Environmental Studies on March 4 and 6 measured the amount of food served to students but not eaten prior to any changes aimed to reduce wasted food were made. Another round of audits will be completed in the spring of 2019 to track progress.

Date	Trays audited	lbs. of wasted food collected
March 4	135	17.2
March 6	124	14
<b>Total</b>	<b>259</b>	<b>31.2</b>

Please note that tray counts are an imperfect measurement of the number of meals served, as not every student uses a tray with their meal. Food service staff estimates 307 meals were served on March 4 and 337 meals were served on March 6. Additionally, some student meal waste may not have been measured during this audit due to students eating their school lunch somewhere other than the lunchroom.

### Tray Audit Findings

The following findings are based on the combined collected data from March 4 and 6. Data and graphs can be provided by day and by specific menu items upon request. All students with wasted food were aimed to be interviewed and all leftover food on trays was sorted. Students without any leftover food were counted as part of the total. Students who brought lunch from home and teachers who ate a school lunch are not included in these findings.

#### By Student

- **43% of all students interviewed wasted some portion of their meal.**

Date	Trays with leftovers	Empty trays	Total	% Empty	% With leftovers
3/4/2019	54	81	135	60.00%	40.00%
3/6/2019	58	66	124	53.23%	46.77%
<b>Total</b>	<b>112</b>	<b>147</b>	<b>259</b>	<b>56.76%</b>	<b>43.24%</b>

- Based on the number of trays collected, **the average student wasted 0.12lbs of food per day.** If 400 students generate this each day, this equals **8,000 pounds of wasted food generated every school year.**
- 110 interview responses were collected over the course of the 2 days.
  - 60 responses (55%) indicated being **too full or not hungry** as the reason for their unfinished food.
  - 8 responses (7%) indicated **not having enough time** to finish their food.

### By Food Category

Milk, fruit, and entrées were the most wasted food categories by weight. The graphs below represent the total wasted food generated over the two day audit period.

#### Food Category Groupings

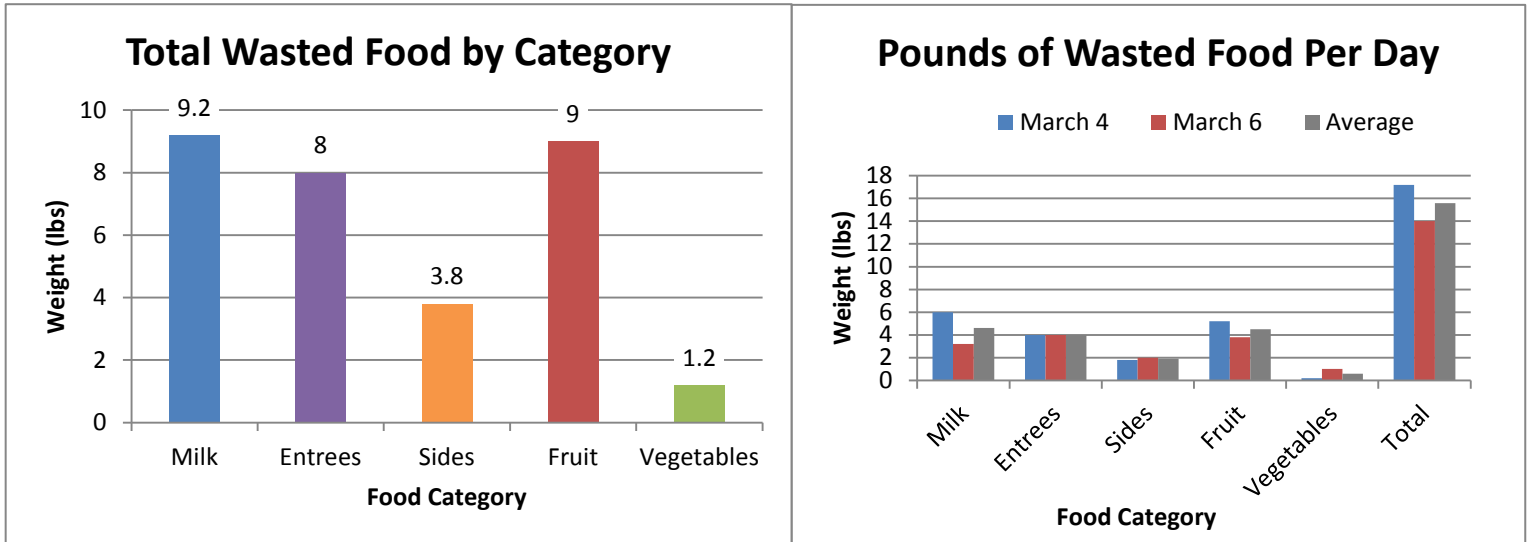
Milk: (29% of all wasted food)

Entrées: Pizza, Burger, Sandwich, Chicken Sliders, Fried Chicken Sandwich, PB+J, Soup (26% of all wasted food)

Sides: Baked Beans, Condiments, Desserts, Hash browns/potato sides (12% of all wasted food)

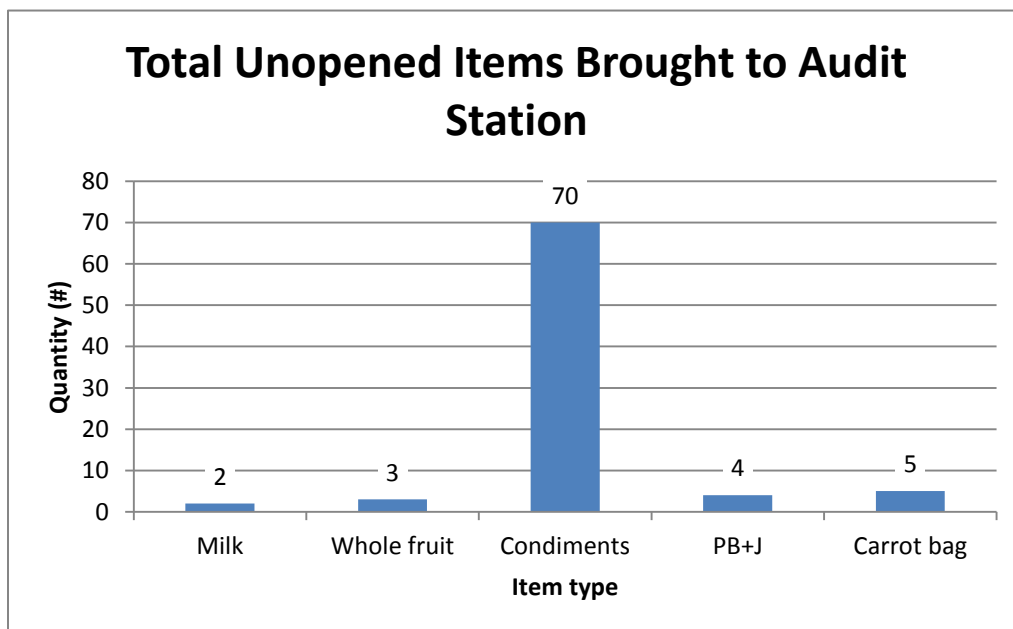
Fruit: Bananas, Apples, Oranges, Cut Fruit Cups (pineapple, watermelon, etc), Peaches (29% of all wasted food)

Vegetables: Carrot, Salad, Cooked Mixed Vegetables (4% of all wasted food)



### Unopened Items

Over the course of 2 days, 84 items were eligible to be placed on a Share Table. The most common eligible item were unopened condiment packets. These items are not included in the total wasted food weights.



## Recommendations

### ISSUE: Students full

- Reduce portion sizes where relevant and/or offer half portions. Consider offering self-serve fruit portions.

### ISSUE: Uneaten food going to waste

- Implement a Share Table
  - Locate away from sorting station, preferably after the point of sale. Clearly label the Share Table with rules and pictures of eligible items. Educate students on how to use the Share Table and its purpose.
  - Designate a staff member to clear and sanitize items for re-sale at the end of each lunch. Establish guidelines on the process of re-sale and what to do with non-eligible items.
- Educate students on reimbursable meal requirements (not required to take milk).
- Consider switching cartons for a milk dispenser.
- Provide beverage options other than milk. Encourage use of water fill stations or provide a bulk water station.
- Distribute kitchen leftovers that would otherwise be tossed (fruits & vegetables) to students and staff. Consider using [USDA approved Nutrient Analysis Software](#) for menu planning.

### ISSUE: High amount of condiments were not used

- Implement a Share Table (see above) to capture unused condiments.
- Establish a limit to the amount of condiment packets each student can take. Consider implementing a bulk condiment station to allow self-serve portions of condiments.
- Expand the condiment station to include a variety of spices and dressings to allow students to customize their meal. See the [Smarter Lunchrooms guidance on Flavor Stations](#).

### ISSUE: Lack of student engagement in cafeteria

- Display a menu board with the day's meal options with creative names readable from 5 feet away when approaching service area. Display a menu board for tomorrow's meals with creative names.
- Identify one fruit and one vegetable as the featured fruit and vegetable of the day at the point of selection.
- Involve students in:
  - The development of creative and descriptive menu item names.
  - Artwork creation or marketing materials for menu items.
  - Feedback opportunities to inform menu development.
- Provide accurate images of all food items on website [Nutrislice](#). Display a link to the cafeteria menu in an easy to find location on the school website and on student iPads.
- Host a "Milk War" contest between houses to encourage less milk waste.
- Market your meals
  - Taste tests with students (i.e., try-day Friday, vote for your favorite).

### ISSUE: Lack of student engagement on the issue of wasted food

- Host a screening and discussion of the documentary "[Just Eat It: A Food Waste Story](#)" for students.
- Incorporate resources like the NRDC report "[Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#)" into course curriculum.
- Consider using John Hopkins Center for a Livable Future's resource [FoodSpan](#). Incorporate "[Lesson 13: Our Wasted Food](#)" into class curriculum.



## Resources

### Implementation resources

- [MN Department of Education](#) Food Safety Resources
  - Share tables: Guidelines and resources
- [Register for Smarter Lunchrooms Movement](#)
  - Complete and register a [Smarter Lunchrooms Scorecard](#)
- [Smarter Lunchrooms: Creative, Fun, and Descriptive Names](#)
- [Smarter Lunchrooms: Printable signs and labels](#)
- [Smarter Lunchrooms: Flavor station guidance](#)
- [USDA approved Nutrient Analysis Software](#) list

### Wasted food educational resources

- [FoodSpan: Teaching the Food System from Farm to Fork. Developed by Johns Hopkins Center for a Livable Future](#)
- [Just Eat it: A Food Waste Story](#)
- NRDC Report [“Wasted: How America is Losing Up to 40 Percent of Its Food From Farm to Fork to Landfill”](#)

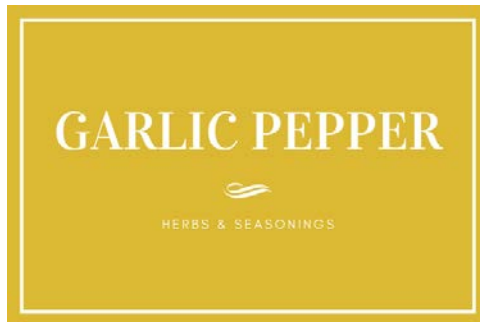


Thank you for your participation and your future efforts to reduce wasted food!

## Appendix G: Flavor Station Spice Labels and Ingredients



- 2 tbsp dill weed
- 1 tbsp garlic powder
- 1 tbsp onion powder
- 1 tbsp paprika
- 1 tbsp parsley
- 1 tbsp sage



- Ground black pepper
- Granulated garlic



- Crushed red pepper flakes



- 2 tbsp cinnamon
- 1 tbsp ground cloves
- 1 tbsp ground ginger
- 1 tbsp nutmeg



- 2 tbsp black pepper
- 1 tbsp cayenne pepper
- 1 tbsp paprika
- 1 tbsp onion powder
- 1 tbsp garlic powder



# FLAVOR STATION

*Savor the flavor*



# Appendix I: Garlough Elementary School Final Report

## Wasted Food Prevention Project Post-Project Tray Audit Report

**School Name:** Garlough Environmental Magnet School

**Location:** West St. Paul, MN

**Post-Project Audit Dates:** April 29, May 6, 9, and 10

### Tray Audit Summary

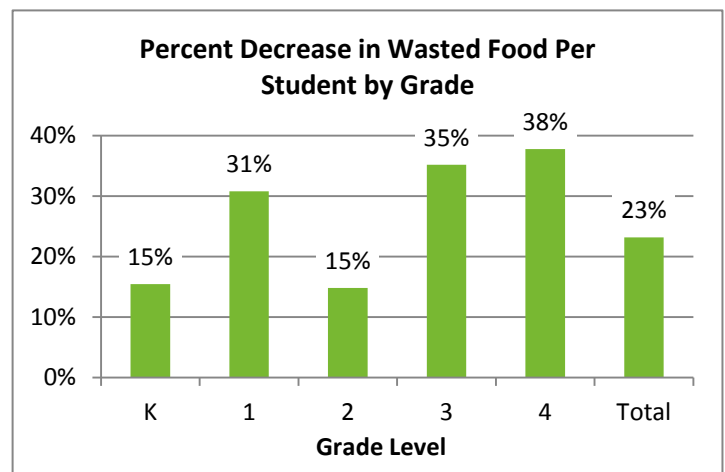
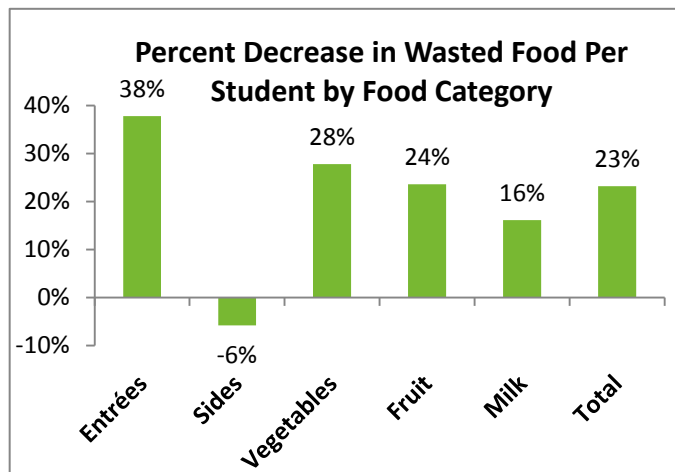
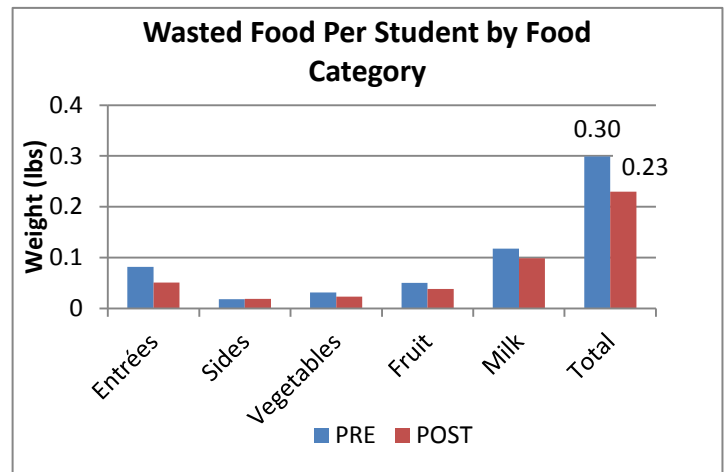
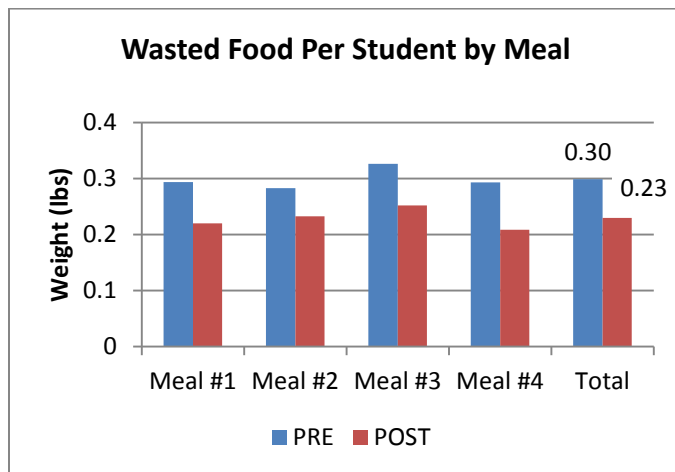
A tray waste audit identifies what and why food is wasted in cafeterias. The post-project tray audits conducted at Garlough Environmental Magnet School on April 29 and May 6, 9, and 10 measured the amount of food served to students but not eaten. Tray audits were conducted before changes were made and after a number of strategies were implemented within the school and cafeteria to reduce wasted food. This report evaluates the successes of those strategies by comparing the wasted food at the same meals from the January pre-project audits to post-project audits in April and May 2019. Student attendance fluctuated for the pre- and post-tray audits; therefore, results are recorded per student in many cases.

Meal	Audit Dates	Food Served
Meal #1	Feb. 1 and Apr. 29	Personal Pizza
Meal #2	Feb. 4 and May 6	Teriyaki Chicken
Meal #3	Feb. 7 and May 9	Sandwiches and Soups
Meal #4	Feb. 8 and May 10	Chicken Patty

	Trays Collected*	Lbs. Wasted food collected
Pre-Project Audits	898	358
Post-Project Audits	1237	284.16

\*Trays collected represent the number of students served a cafeteria meal.

### Project Results



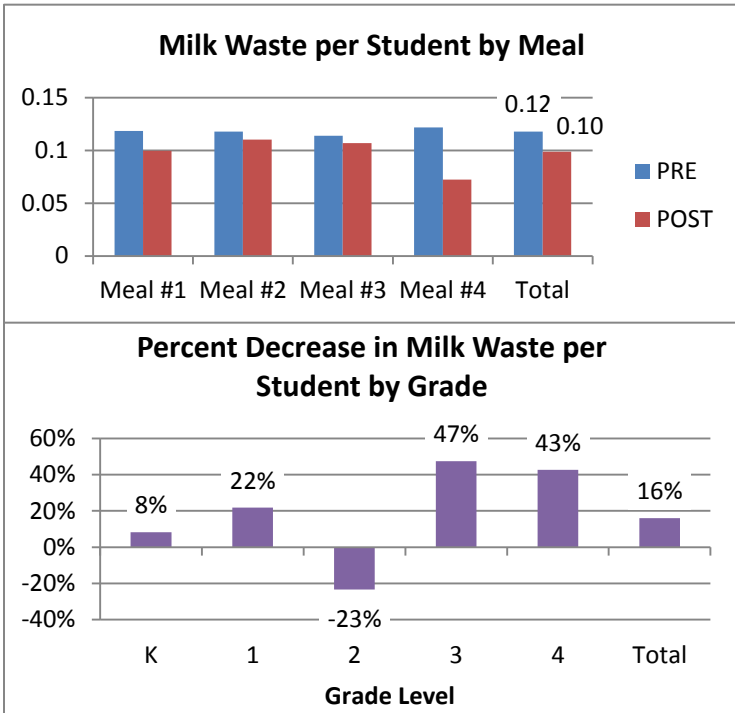
\* A negative percentage indicates an increase in wasted food per student



### Goal 3: Reduce milk waste

#### Strategy: Improve water access in the cafeteria to provide a beverage alternative to milk

In the pre-project audits, milk was the most wasted food item by weight. One three-gallon portable water dispenser was implemented in the cafeteria to provide students with a free beverage alternative to milk. 81 cups were used over two of the post-project audit days. If 81 students chose to drink water from the dispenser, this is 14% of all students counted in those post-project audits. Additionally, staff report the 3 gallon water dispenser is emptied every day during one of the last two periods. One pound of waste water (or 1/8 gallon) was collected during the four audit days, meaning the school water consumption has increased by nearly 3 gallons per day since the implementation of the water dispenser. Post-project audit results show that Garlough cut their wasted milk by 16%. The 1023 pounds of milk waste prevented per school year [is equivalent to saving 125,927 gallons of water from going to waste every year.](#)



\* A negative percentage indicates an increase in wasted food per student

		Cups used	
Date	Grade	5/9/2019	5/10/2019
5/9/2019	K	5	11
	1	0	0
	2	16	0
	3	6	11
	4	18	14
	<b>Total</b>	<b>45</b>	<b>36</b>

### Goal 4: Prevent unopened, uneaten, and packaged items from going to waste

#### Strategy: Improve Share Table visibility, awareness, and education

A new Share Table with signs that include images and rules was added to the cafeteria so unopened, uneaten, packaged items from school meals could be redistributed rather than be placed in the trash or compost. Students can take leftover items placed on the Share Table or items can be incorporated back into the school lunch program. Share Table items not taken during lunch are placed in a mini fridge in the "Green Room" - a place where students go to decompress. Students viewed a video created by LIVEGREEN students explaining the Share Table and its purpose.



During the post-project audits, 18 items were recorded on the Share Table. This count does not include items placed on the cart and taken by students during lunch, so the Share Table may save more items from going to waste than this number depicts. 23% fewer items came to the audit station in the post-project audits than the pre-project audits. Assuming this decrease can be attributed to an increased use of the Share Table, the Share Table prevented 15 items over the 4 audit days from going to waste.

Note: the audit station could have affected student behavior

## Annual impacts

### Total pounds of wasted food prevented

	Pre-Strategy Implementation	Post- Strategy Implementation
Lbs. per student	0.30	0.23
Lbs. per student per school year	53.83	41.35
Total school lbs. per school year	16,150	12,405
<b><i>Savings per school year(lbs.)</i></b>		<b>3,745</b>

### Water saved from preventing wasted milk

	Pre- Strategy Implementation	Post- Strategy Implementation
Lbs. per student	0.12	0.10
Lbs. per student per school year	21.20	17.79
Total school lbs. per school year	6,361	5,337
<b><i>Savings per school year(lbs.)</i></b>		<b>1,023</b>

## Recommendations for further wasted food prevention

- Conduct regular (annual, bi-annual, or quarterly) tray audits to track progress. Dakota County can supply materials.
- Develop a food waste action plan. See the Minneapolis Public Schools [True Food, No Waste](#) Action Plan.
- Keep encouraging students to use the Share Table. Incorporate the Share Table into waste sort training at the beginning of the year with students.
- Designate a staff member or student to clear and sanitize Share Table items for redistribution daily.
- Switch out milk cartons for a bulk dispenser.
- Continue providing water as a beverage alternative to milk.
- Involve students in development of menu item names and cafeteria artwork creation.
- Provide student feedback opportunities to inform menu development.
- Try a one last sip/bite campaign (Example: [Sioux Trail Elementary](#)).
- Register for the [Smarter Lunchrooms Movement](#) and fill out their scorecard. Implement strategies for further wasted food reduction.

## Resources

### Guidelines and action plans

- [MN Department of Education](#) Food Safety Resources – Share Ttables: Guidelines and resources
- [Smarter Lunchrooms Movement](#)
- Minneapolis Public Schools [True Food, No Waste](#) Action Plan

### Curriculum and lesson plans

- Commission for Environmental Cooperation (CEC)'s [Food Matters Action Kit](#)
- World Wildlife Fund's [Food Waste Warrior Toolkit](#)
- [Dakota County School Recycling Program](#)

# Appendix J: Heritage Middle School Final Report

## Wasted Food Prevention Project Post-Project Tray Audit Report

**School Name:** Heritage E-STEM Magnet School

**Location:** West St. Paul, MN

**Post Project Audit Dates:** May 16 and 17

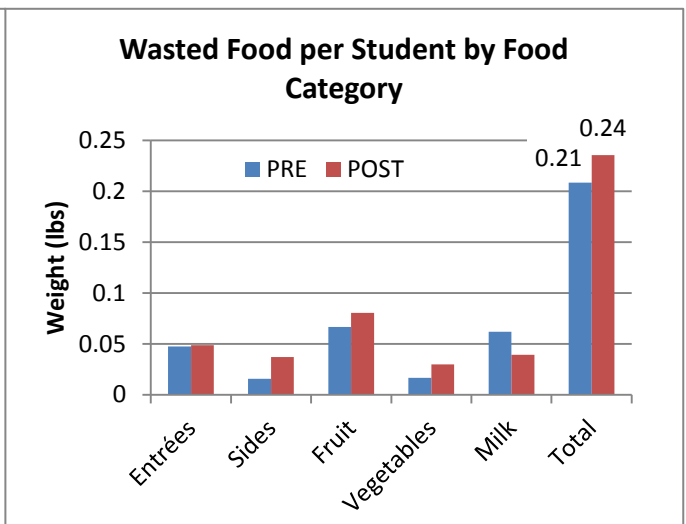
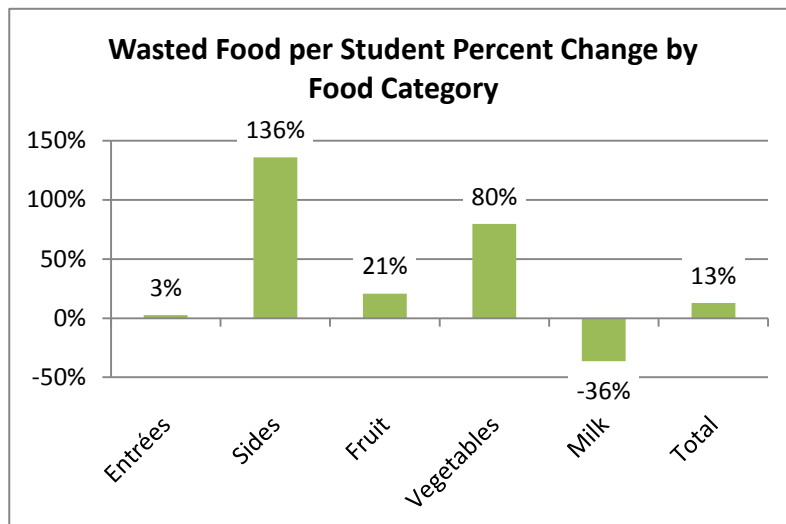
### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The post-project tray audits conducted at Heritage E-STEM Magnet School on May 16 and 17 measured the amount of food served to students but not eaten. Tray audits were

conducted before changes were made and after a number of strategies were implemented within the school and cafeteria to reduce wasted food. This report evaluates the successes of those strategies by comparing the wasted food at the same meals from the February pre-project audits to post-project audits in May 2019. Student attendance fluctuated for the pre- and post-tray audits; therefore, results are recorded per student in many cases.

\* Trays collected represent the number of students served a cafeteria meal.

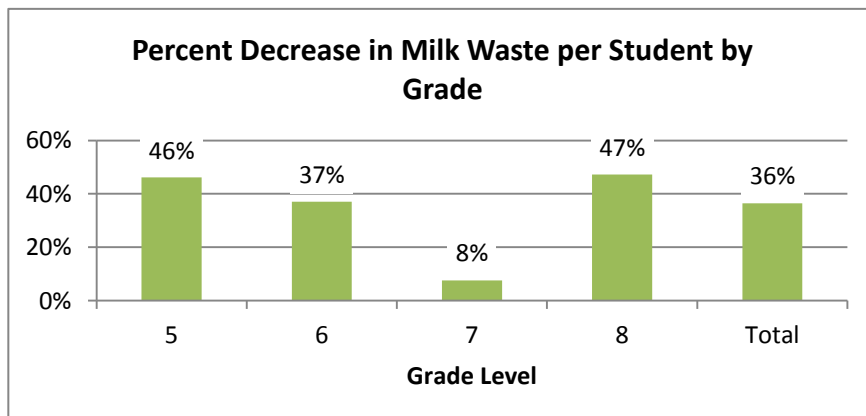
	Trays Collected*	Lbs. Wasted food collected
<b>Pre-Project Audits</b>	1057	220.6
<b>Post-Project Audits</b>	923	217.6



### Goal 1: Reduce milk waste

#### Strategy: Improve water access in the cafeteria to provide a beverage alternative to milk

In the pre-project audits, milk was the second most wasted food item by weight. Two three-gallon portable water dispensers were implemented in the cafeteria to provide students with a free beverage alternative to milk. Over the two post-audit days, 173 cups were used. If 173 students chose to drink water from the dispenser, this is 19% of all students counted in the post-project audits. Additionally, the two three-gallon water dispensers are filled twice daily on average. During the post-project audits, 0.43 gallons of water were collected at the audit station, meaning school water consumption has increased by almost 12 gallons per day since the implementation of the water dispensers. Additionally, milk waste per student decreased by 36% since the pre-project audits.





The milk waste reduction seen in the post-project audit results would equal 2,036 pounds of milk waste per year, assuming 500 students reduced their milk waste by 0.02 pounds per day for a whole school year. This is [equivalent to preventing 218,846 gallons of water from going to waste every year.](#)

	Pre- Strategy Implementation	Post- Strategy Implementation
Lbs. milk waste per student	0.06	0.04
Lbs. milk waste per student per school year	11.17	7.10
Total school lbs. milk waste per school year	5586	3549
<b>Savings per school year (lbs.)</b>		<b>2036</b>

## Goal 2: Prevent unopened, uneaten, and packaged items from going to waste

### Strategy: Improve Share Table visibility and awareness in cafeterias and classroom common areas, and redistribute items to be eaten

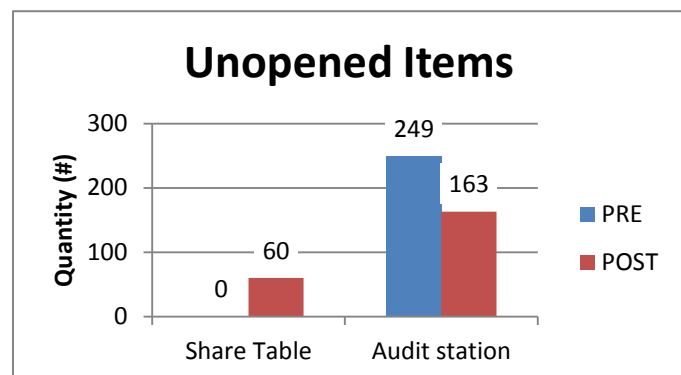
A new Share Table was implemented in the cafeteria that includes signs with images and rules. The signs were also placed on Share Tables in the classroom common areas where students sort their breakfast waste daily. These Share Tables aim to capture more unopened, uneaten, packaged items from school meals for redistribution, rather than have them go in the trash or compost. Students can take leftover items placed on the Share Table to eat now or later. Perishable Share Table items not taken by students during lunch and breakfast are placed in a mini fridge in the office of the school's 360 Communities Family Support Worker. The items are then given to students who get hungry throughout the day.



Large quantities of shareable items are generated every day at breakfast and lunch, and the mini fridge is often at capacity. School staff and the Family Support Worker are piloting a new program to get this surplus food home to students and families. Students will take cooler bags filled with surplus Share Table items home. For the pilot, the weights of food items will be recorded to see evaluate the program.

In the pre-project audits, 249 unopened items that were eligible to be shared were brought to the audit station. In the post-project audits, 60 items were recorded on the Share Table. This count does not include items placed on the cart and taken by students during lunch, so the Share Table may save more items from going to waste than this number depicts. However, 163 items still came to the audit station, meaning at most 73% of items eligible to be shared were not placed on the Share Table.

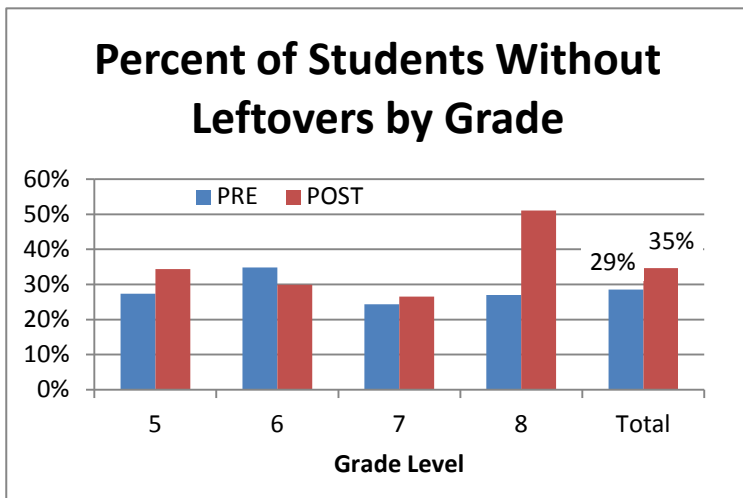
*Note: the audit station could have affected student behavior.*



## Goal 3: Provide opportunities for students to customize their meals to encourage more overall consumption

### Strategy: Implement a spice station to allow meal customization

A spice station boosts student interest in school lunch by giving them choice and variety – without having to change the menu. In the post-project audits, 6.1% more students did not have leftovers compared to pre-project audits.



## Recommendations for further wasted food prevention

- Conduct regular (annual, bi-annual, or quarterly) tray audits to track progress. Dakota County can supply materials.
- Develop a food waste action plan. See the Minneapolis Public Schools [True Food, No Waste](#) Action Plan.
- Keep encouraging students to use the Share Table. Incorporate the Share Table into waste sort training at the beginning of the year with students.
- Designate a staff member or student to clear and sanitize Share Table items for redistribution daily.
- Continue providing accessible, free water in the cafeteria. Promote water as a beverage alternative to milk.
- Educate students on USDA meal requirements.
- Involve students in development of menu item names and cafeteria artwork creation.
- Provide student feedback opportunities to inform menu development.
- Continue using the Spice Station and provide opportunities for student to provide feedback on spice selections.
- Switch out milk cartons for a bulk dispenser.
- Try a one last sip/bite campaign (Example: [Sioux Trail Elementary](#)).
- Host a student documentary screening of "[Just Eat It: A Food Waste Story](#)", available through Dakota County.
- Register for the [Smarter Lunchrooms Movement](#) and fill out their scorecard. Implement strategies for further wasted food reduction.

## Resources

### Guidelines and action plans

- [MN Department of Education](#) Food Safety Resources – Share Tables: Guidelines and resources
- [Smarter Lunchrooms Movement](#)
- The Minneapolis Public Schools [True Food, No Waste](#) Action Plan

### Educational resources and lesson plans

- Commission for Environmental Cooperation (CEC)'s [Food Matters Action Kit](#)
- NRDC's report "[Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#)"
- John Hopkins Center for a Livable Future's resource [FoodSpan. Lesson 13: Our Wasted Food](#)
- World Wildlife Fund's [Food Waste Warrior Toolkit](#)
- [Dakota County School Recycling Program](#)

# Appendix KJ: Pine Bend Elementary School Final Report

## Wasted Food Prevention Project Post-Project Tray Audit Report

**School Name:** Pine Bend Elementary School

**Location:** Inver Grove Heights, MN

**Post-Project Audit Dates:** May 29 and 30

### Tray Audit Summary

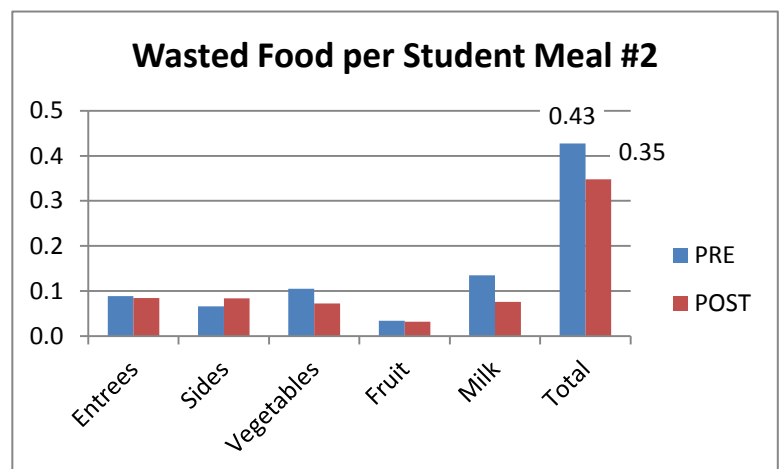
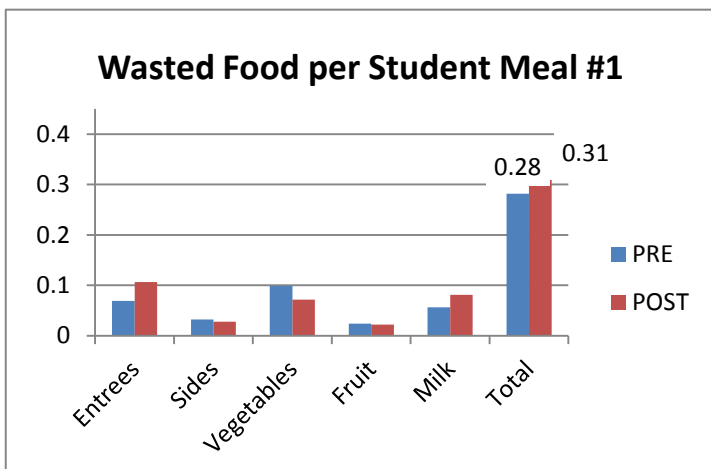
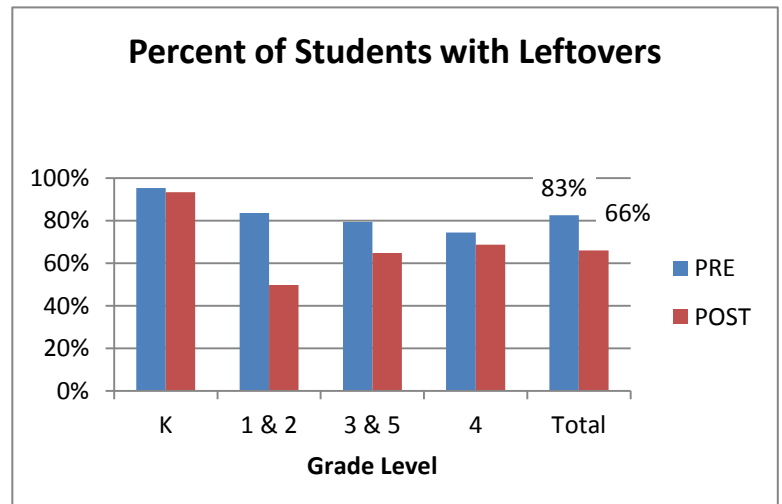
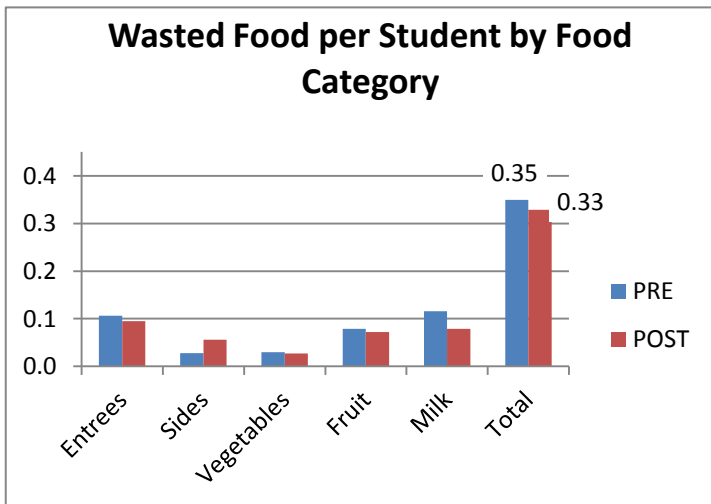
A tray waste audit identifies what and why food is wasted in cafeterias. The post-project tray audits conducted at Pine Bend Elementary School on May 29 and 30 measured the amount of food served to students but not eaten. Tray audits were conducted before changes were made and after a number of strategies were implemented within the school and cafeteria to reduce wasted food. This report evaluates the successes of those strategies by comparing the wasted food at the same meals from the January pre-project audits to post-project audits in May 2019. Student attendance fluctuated for the pre- and post-tray audits; therefore, results are recorded per student in many cases.

Meal	Audit Dates	Food Served
Meal #1	Jan. 9 & May 29	Hot Dog/ Cheeseburger and Sloppy Joe
Meal #2	Jan. 10 & May 30	Chicken Pot Pie and Cheese Omelet

	Trays Collected*	Lbs. Wasted food collected
Pre-Project Audits	722	252.2
Post-Project Audits	723	237.6

\*Trays collected represent the number of students served a cafeteria meal.

### Project Results

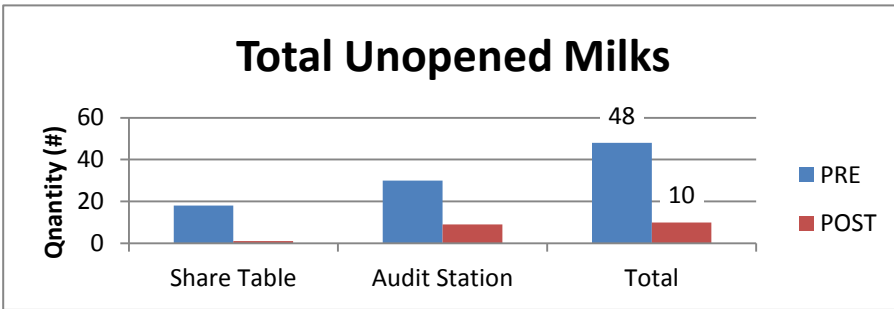
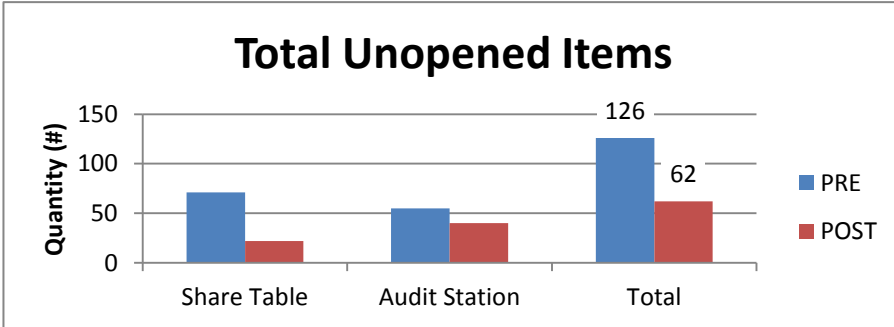


Note: Meal #1 served hot dogs and sloppy joes during the pre-project audits. During the post-project audits, cheeseburgers were served instead of hotdogs. This change may explain the increase in wasted food by weight for this meal.

## Goal 1: Prevent unopened, uneaten, and packaged items from going to waste

### Strategy: Improve Share Table Visibility, awareness, and education

A new Share Table with signs that include images and rules was added to the cafeteria so unopened, uneaten, and packaged items from school meals could be redistributed rather than be placed in the trash or compost. Students can take leftover items placed on the Share Table or items can be incorporated back into the school lunch program. During the post-project audits, 22 items were recorded on the Share Table. This count does not include items placed on the cart and taken by students during lunch, so the Share Table may save more items from going to waste than this number depicts. The total number of items eligible to be shared decreased by 51% in the post-project audits. The total amount of unopened milks, which was the most common unopened item in the pre-project audits, decreased by 79% in the post-project audits.

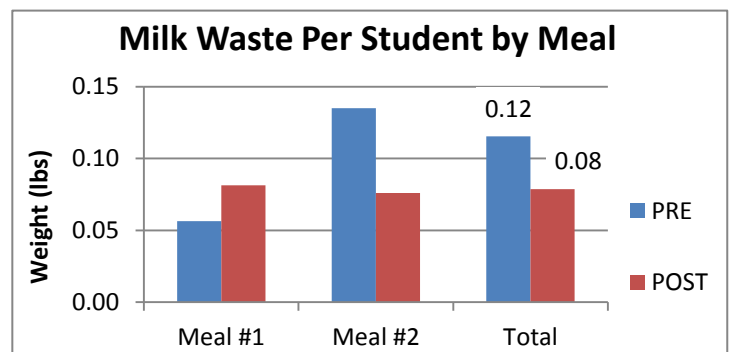
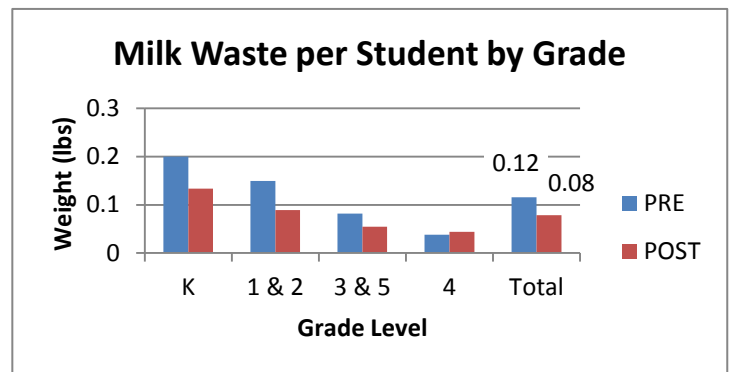


Note: the audit station could have affected student behavior

## Goal 2: Reduce milk waste

### Strategy: Host a milk waste challenge to show students how much milk is thrown away

The principal and Green Team began a milk waste challenge in March 2019. Milk waste in the liquids buckets was measured each day. Students were also taught at a school assembly about USDA meal requirements, including that they are not required to take a milk carton. Overall, milk waste per student decreased in the post-project audits by 32%. The 2,700 pounds of milk waste prevented per school year is equivalent to saving 329,994 gallons of water from going to waste every year.



Gallons	4/1	4/2	4/3	4/4	4/5
Gallons	4/8	4/9	4/10	4/11	4/12
Gallons	4/15	4/16	4/17	4/18	4/19
Gallons	4/22	4/23	4/24	4/25	4/26
Gallons	4/29	4/30			



## Annual Impacts

### Total pounds of wasted food prevented

	Pre-Strategy Implementation	Post- Strategy Implementation
Lbs. per student	0.35	0.33
Lbs. per student per school year	63	59.4
Total school lbs. per school year	23,625	22,275
<b><i>Savings per school year(lbs.)</i></b>		<b>1,350</b>

### Total pounds of wasted milk prevented

	Pre-Strategy Implementation	Post- Strategy Implementation
Lbs. per student	0.12	0.08
Lbs. per student per school year	21.6	14.4
Total school lbs. per school year	8,100	5,400
<b><i>Savings per school year(lbs.)</i></b>		<b>2,700</b>

## Recommendations for further wasted food prevention

- Conduct regular (annual, bi-annual, or quarterly) tray audits to track progress. Dakota County can supply materials.
- Develop a food waste action plan. See the Minneapolis Public Schools [True Food, No Waste](#) Action Plan.
- Keep encouraging students to use the Share Table. Incorporate the Share Table into waste sort training at the beginning of the year with students.
- Designate a staff member or student to clear and sanitize Share Table items for redistribution daily.
- Offer all students a half size portion option for entrées. Allow them to report their choice in the morning.
- Dim the lights around five minutes before the end of each lunch period and request quiet to get students to focus on eating and help with the transition from lunch back into class time.
- Continue the milk waste challenge into future school years.
- Switch out milk cartons for a bulk dispenser.
- Offer water as a beverage alternative to milk.
- Involve students in development of menu item names and cafeteria artwork creation.
- Provide student feedback opportunities to inform menu development.
- Register for the [Smarter Lunchrooms Movement](#) and fill out their scorecard. Implement strategies for further wasted food reduction.

## Resources

### Guidelines and action plans

- [MN Department of Education](#) Food Safety Resources – Share Tables: Guidelines and resources
- [Smarter Lunchrooms Movement](#)
- Minneapolis Public Schools [True Food, No Waste](#) Action Plan

### Curriculum and lesson plans

- Commission for Environmental Cooperation (CEC)'s [Food Matters Action Kit](#)
- World Wildlife Fund's [Food Waste Warrior Toolkit](#)
- [Dakota County School Recycling Program](#)

# Appendix L: School of Environmental Studies Final Report

## Wasted Food Prevention Project Post-Project Tray Audit Report

**School Name:** School of Environmental Studies  
**Location:** Apple Valley, MN  
**Post Project Audit Dates:** May 8 and 10

### Tray Audit Summary

A tray waste audit identifies what and why food is wasted in cafeterias. The tray audits conducted at the School of Environmental Studies (SES) on May 8 and 10 measured the amount of food served to students but not eaten. Tray audits were conducted before changes were made and after a number of strategies were implemented within the school and cafeteria to reduce wasted food. This report evaluates the successes of those strategies by comparing the wasted food at the same meals from the March pre-project audits to post-project audits in May 2019.

\* Trays collected represent the number of students served a cafeteria meal.

	Trays Collected*	Lbs. Wasted food collected
Pre-Project Audits	259	31.2
Post-Project Audits	259	20.4

### Project Summary

#### Strategies Used to Reduce Wasted Food

- **Issue:** Food that could have been eaten was being thrown away or composted.  
**Strategy:** Created new Share Table. Students can place unopened food and beverage items that they have chosen not to eat or drink on the Share Table. Items can be redistributed to students or put back into the school lunch program. SES AVID students created signs and monitored the Share Table daily during lunch periods to explain its purpose to fellow students.
- **Issue:** Lack of opportunities for students to customize meal flavors.  
**Strategy:** Added a “Flavor Station” to boost student interest in school lunch by providing choice and variety – without having to change the menu. SES already offered a variety of condiments to their students prior to this project. This addition was another way to provide students with meal customization options.
- **Issue:** Students are unaware of wasted food as an environmental issue.  
**Strategy:** Increased education on the environmental impacts of wasted food.
  - AVID students listened to a presentation on wasted food prior to the pre-project audits.
  - MN GreenCorps member presented on wasted food at a SES Earth Day Celebration breakout session.
  - AVID students created table tents for cafeteria tables highlighting issues related to wasted food and solutions.
  - AVID students met with kitchen staff to learn about USDA meal requirements. These students then acted as liaisons to their classmates as experts on the subject verbally and through signage.
  - AVID students created posters on wasted food and posted around the school.
  - AVID students asked fellow students to commit to reduce food waste. Each student put their pledge on a Post-it note and all pledges were displayed in the hallway leading to the lunchroom.



## Project Outcomes

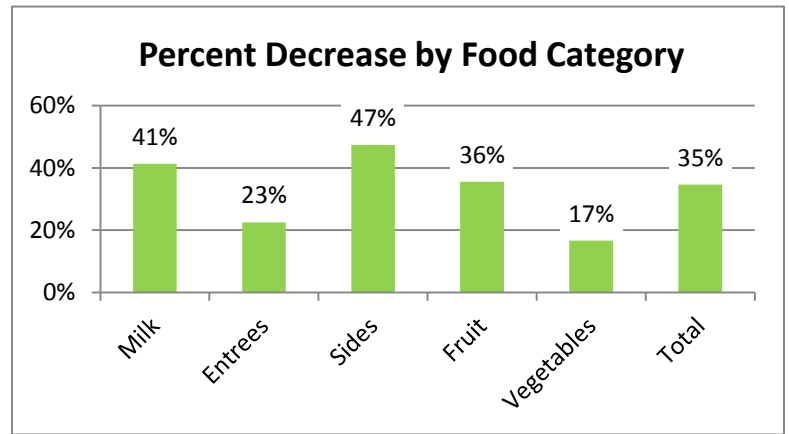
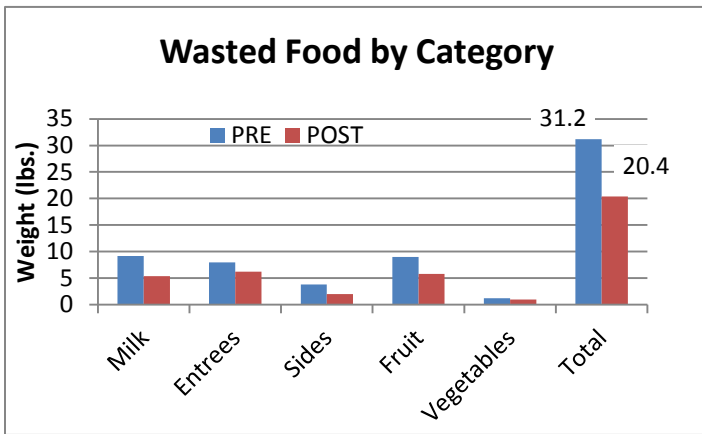
### Reduced wasted food per student

In the pre-project audits, the average student wasted 0.12lbs of food per day. In the post-project audits, the average student wasted 0.08 pounds per student. This is an annual school savings of 938 pounds assuming 125 students eat school lunch daily.

	Pre- Strategy Implementation	Post- Strategy Implementation
Lbs. per student daily	0.12	0.08
Lbs. per student per school year	21.7	14.2
Total school lbs. per school year	2,710	1,772
<b>Savings per school year(lbs.)</b>		<b>938</b>

### Reduced wasted food by categories

The top three wasted food categories were milk, entrées, and fruit in both pre-project and post-project audits. However, these wasted food categories were reduced by 41%, 23% and 36% in the post-audits, respectively.



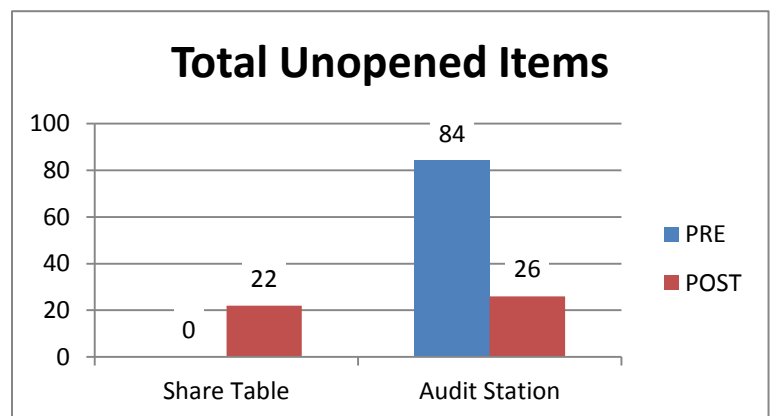
### Reduced wasted milk

Post-project audit results show that SES cut their wasted milk by 41%, which prevents 330 pounds of milk waste per school year. This [is equivalent to preventing 40,333 gallons of water from going to waste every year.](#)

	Pre- Strategy Implementation	Post- Strategy Implementation
Lbs. per student daily	0.04	0.02
Lbs. per student per school year	6.4	3.8
Total school lbs. per school year	799	469
<b>Savings per school year(lbs.)</b>		<b>330</b>

### Reduced wasted packaged items

In the pre-project audits 100% of uneaten, unopened, and packaged items came to the audit station and were sorted as trash. In the post-project audits, 46% (22 items out of 48) were instead placed on the Share Table. Additionally, 43% fewer packaged and uneaten items were generated in the post- project audits. This implies that more items are being consumed or fewer unwanted packaged items are being taken by students.



## Recommendations for further wasted food prevention

- Conduct regular (annual, bi-annual, or quarterly) tray audits to track progress. Dakota County can supply materials.
- Develop a wasted food action plan. See Minneapolis Public School's [True Food, No Waste](#) Action Plan. Ensure that campaigns and strategies are able to be carried across different years. Create a framework for new students to get involved and progress the previous years' work.
- Keep encouraging students to use the Share Table. Incorporate the Share Table into waste sort training at the beginning of the year with students.
- Continue student education on USDA meal requirements.
- Involve students in development of menu item names and cafeteria artwork creation.
- Provide student feedback opportunities to inform menu development.
- Continue using the Flavor Station and provide opportunities for students to give feedback on spice selections.
- Establish a limit to the amount of condiment packets each student can take. Consider implementing a bulk condiment station to allow self-serve portions of condiments.
- Switch out milk cartons for a bulk dispenser.
- Promote water as a beverage alternative to milk.
- Try a one last sip/bite campaign (Example: [Sioux Trail Elementary](#)).
- Host a screening and discussion of the documentary "[Just Eat It: A Food Waste Story](#)" for students, available through Dakota County.
- Register for the [Smarter Lunchrooms Movement](#) and fill out their scorecard. Implement strategies for further wasted food reduction.

## Resources

### Guidelines and action plans

- [MN Department of Education](#) Food Safety Resources – Share Tables: Guidelines and resources
- [Smarter Lunchrooms Movement](#)
- Minneapolis Public School's [True Food, No Waste](#) Action Plan

### Educational resources and lesson plans

- Commission for Environmental Cooperation (CEC)'s [Food Matters Action Kit](#)
- NRDC's report "[Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#)"
- John Hopkins Center for a Livable Future's resource [FoodSpan. Lesson 13: Our Wasted Food](#)
- World Wildlife Fund's [Food Waste Warrior Toolkit](#)
- [Dakota County School Recycling Program](#)



# Appendix M: School District Wasted Food Cafeteria Inventory Sample Survey

[Exit](#)

**Randolph Public Schools, ISD 195 Cafeteria Inventory**

Welcome

Thank you for participating in this survey. Your feedback is important.

The goal of this survey is to determine what efforts K-12 schools in Dakota County are making to **prevent** wasted food. "Wasted food" is defined as food that was meant to be eaten, but wasn't.

This survey intends to gather information on schools located in Dakota County. Schools that are in your District but are located outside of the Dakota County border are **not** included in this survey.

This survey should take approximately **15 minutes** to complete. Please contact Hannah Keller with any questions ([hannah.keller@co.dakota.mn.us](mailto:hannah.keller@co.dakota.mn.us), 952-891-7026),

**Randolph Public Schools, ISD 195 Cafeteria Inventory**

District Information

**\* 1. How is food ordered for schools in your District?**

Please be as detailed as possible (e.g., who completes order placement, final approval process).

**\* 2. Does your District have a plan or policy to reduce wasted food?**

(e.g., food waste tracking, food donation)

Yes

No

If yes, please describe

**\* 3. Do schools in your district use a Nutrient Analysis Software for menu planning and tracking wasted food? [See examples here](#)**

No, schools in this district do not use a Nutrient Analysis Software.

Yes, schools in this district use a Nutrient Analysis Software.

## Randolph Public Schools, ISD 195 Cafeteria Inventory

### Nutrient Analysis Software

**\* 4. Which Nutrient Analysis Software do schools in your district use for menu planning and tracking wasted food?**

- Cartewheel
- Eatec Solutions by Agilysys
- eTriton
- Health-e Meal Planner
- KidServe
- MCS Edison Menus & Inventory
- MCS WinFSIM Menus & Inventory
- Meal Magic Suite - Nutrition Magic
- Meals Plus Menus
- Mosaic Menu Planning
- NUTRIKIDS: Menu Planning & Nutritional Analysis
- OneSource- Menu Planning and Nutrient Analysis
- PRIMA Web
- PrimeroEdge - Menu Planning Module
- Solana
- TITAN School Solutions
- TrakNOW - Nutrition and Inventory
- WebSMARTT Menu Planning & Production
- Webtrition
- Other (please specify)

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## Randolph Public Schools, ISD 195 Cafeteria Inventory

### Share Table practices

**\* 5. Does your District have a policy on food "Share Tables"?**

A food "Share Table" in the school cafeteria allows students to give away their unwanted, still packaged or uneaten food items so other students can select these food and beverage items at no cost during mealtime. This can be a formal or informal practice.

Yes

No

If yes, please describe

**\* 6. Are Share Tables at the following schools in Dakota County clearly marked with rules and images?**

	Yes, the Share Table is clearly marked	No, the Share Table is not clearly marked	There is no Share Table at this school	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 7. How do students in the following schools learn how to use the Share Table and its purpose at the following schools in Dakota County? Please describe in the text boxes below.**

Randolph Elementary

Randolph High School

**\* 8. Do the following schools in Dakota County have a documented staff procedure on how to clear the Share Table and redistribute eligible food items?**

	Yes	No	There is no Share Table at this school	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Randolph Public Schools, ISD 195 Cafeteria Inventory

### School Practices

**\* 9. Do the following schools in Dakota County offer recess before lunch?**

	Yes -- all grades	Yes -- some grades	No	Unsure	Not applicable/ No recess
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 10. What is the approximate length of each lunch period at the following schools in Dakota County?**

	20 min. or less	21-30 min.	31 min. or more	The length of each lunch period depends on the grade level	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 11. Please describe current signage that displays meals or food items that will be served in the cafeteria at the following schools in Dakota County.**

Signage can be in the cafeteria or around the school. (e.g., whiteboard, TV monitors, labels along serving line)

Randolph High School

Randolph Elementary

**\* 12. Do the following schools in Dakota County provide a spice or seasoning self-serve station for students to use?**

	Yes	No	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 13. Do the following schools in Dakota County regularly offer cut or sliced fruit, such as sliced apples and oranges, to students?**

	Yes	No	For younger students only	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 14. Do the following schools in Dakota County offer breakfast in the classroom?**

	Yes	No	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 15. In your opinion, is the staff at the following schools in Dakota County knowledgeable about reimbursable meal requirements?**

(e.g., that students aren't required to take a milk)

	Yes, the staff at this school are adequately knowledgeable	No, the staff at this school could be more knowledgeable	Unsure
Randolph Elementary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Randolph High School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Randolph Public Schools, ISD 195 Cafeteria Inventory

### Final Comments

**16. *Optional:* Please describe any efforts not mentioned earlier in the survey that schools in your District make to reduce wasted food.**

**\* 17. What resources does your District need to properly address wasted food?**

(e.g., signage, guidance, infrastructure needs)

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Done

## Appendix N: Wasted Food Prevention Best Practices

### WASTED FOOD PREVENTION BEST PRACTICES

#### CONDUCT REGULAR TRAY AUDITS

To identify problem areas specific to your school

- Track your progress to mark improvements

#### PROVIDE A SHARE TABLE\*

To enable unopened food to be redistributed to students or donated

- Label with images and rules
- Incorporate into regular sorting education
- Establish a policy within your school on how to redistribute share table items and share with your health inspector

*\*Approved by the USDA and MN Dept. of Health*



#### OFFER APPROPRIATELY SIZED SERVINGS

To support students to take what they know they can eat

- Allow students to request half sized entrée portion sizes
- Standardize morning meal reporting sheets and remind students of their selection
- Slice apples or other hard to eat items for younger students



#### EDUCATE STUDENTS ON MEAL REQUIREMENTS

To streamline the lunch line and save more time for eating

- Assist students to make choices to minimize their wasted food while fulfilling requirements faster

#### PROVIDE ACCESS TO WATER

To provide a beverage alternative to milk and increase hydration

- Fulfill a National School Lunch Program requirement to make water available where lunch meals are served
- Promote reusable cups and water bottles over recyclable cartons



#### SCHEDULE RECESS OR EXERCISE BEFORE LUNCH

To increase student appetite

- Can reduce plate waste by as much as 30%

#### IMPROVE STUDENT TIME MANAGEMENT

To boost overall consumption

- Dim lights and request quiet time at end of lunch
- Alert students of time left in lunch period
- Extend lunch periods to 30 minutes

#### OFFER A FLAVOR STATION

To allow older students to customize meals

- Follow low sodium requirements



Learn more at [www.dakotacounty.us](http://www.dakotacounty.us), search *food waste*

*Dakota*

# Appendix O: School Partner Pledge



## MN GreenCorps 2018-2019 Wasted Food Prevention School Pledge

### Participant Information

School Name: \_\_\_\_\_  
Student Population Size: \_\_\_\_\_  
Lead Contact: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

### Project Description

Dakota County has a goal to provide recommendations and best practices to reduce wasted food in Dakota County schools. To reach this goal, the MN GreenCorps member will help evaluate wasted food barriers and opportunities in Dakota County schools and pilot national best practices in participating K-12 schools. Recommendations and success of the project will be measured through tray waste audits and interviews with school staff and students.

### MN GreenCorps Member and Dakota County Staff Pledge To:

- Inventory the current wasted food prevention practices
- Provide best practice recommendations for preventing wasted food
- Help implement best practices
- Provide education resources and educate teachers, students, and food service staff
- Measure project success through tray audits before and after best practice implementation

### Schools Partner Pledges To:

- Provide a lead contact for County
- Engage a committed group of students to help with the project
- Complete Dumpster Assessment Form before and after best practice implementation
- Help conduct tray audits before and after best practice implementation
- Allow students and staff to be interviewed
- Implement agreed-upon recommendations

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
MN GreenCorps Member

\_\_\_\_\_  
Dakota County Representative

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



# Appendix P: Sample Weight Log

Date: \_\_\_\_\_  
 School: \_\_\_\_\_



## Tray Audit Weight Log

Tracker's name: \_\_\_\_\_ Trays w/ food (#): \_\_\_\_\_ Empty bucket (lbs.) \_\_\_\_\_  
 Meal period: \_\_\_\_\_ Empty trays (#): \_\_\_\_\_

Category	What	Total weight including bucket (lbs.)	Weight of food (lbs.) *subtract weight of empty bucket from total weight	Comments
Entrées	<i>Ex: Pizza</i>	<i>2.8</i>	<i>0.6</i>	<i>*weight of empty bucket is 2.2 lbs.</i>
Sides/Other				
Fruits				
Vegetables				
Milk				

## Unopened Items Log

Food Item	Weight of 1 item (lbs.)	Audit Station (#)	Share Table (#)
<i>Ex: Milk carton</i>	<i>.50lbs</i>	<i>5</i>	<i>7</i>

