



# REDUCING FOOD WASTE IN SCHOOLS: THE BUSINESS CASE



A recent study completed by World Wildlife Fund (WWF) analyzed student plate waste<sup>1</sup> across 46 schools in 8 states, the largest study of its kind to measure food waste in schools. The results were eye opening: on average, 39.2 pounds of food per student per year, and 28.7 cartons of milk per student per year were wasted. While at first glance these estimates may seem small, when you consider that there are nearly 100,000 public schools in the US<sup>2</sup> with 29.6M<sup>3</sup> students served daily as part of the National School Lunch Program (NSLP), the implications are daunting; it amounts to a major loss of nutrients and an estimated \$9.7M thrown out per day nationally. Based on a 180-day school year<sup>4</sup>, that adds up to \$1.7B annually (see Appendix 1 for calculations). Reducing plate waste can save money, enabling savings to be re-invested into school food programs to improve food and nutritional quality, educational programs, and local economies.

Student food waste is complicated and occurs for a variety of reasons. Milk and vegetables are among the items most wasted, however, menu design, portion sizes, food preparation techniques and short lunch times represent just a few of the many reasons why food is wasted in schools. For school lunches to qualify for full reimbursement through USDA's NSLP, students must receive food from at least three out of five categories (meat/meat alternate, vegetable, fruit, milk and grain - including at least one fruit or vegetable serving). Added to this complexity are demographic differences such as income, and the reality that regulations vary from state to state, which makes implementing broad changes to how food is prepared and served difficult. Nevertheless, change is both possible and imperative and there are

many opportunities to ensure more students are eating nutritious food while not creating waste.

WWF's experience working to reduce food waste across other food service sectors has shown that one of the best ways to jumpstart waste reduction practices is to consistently separate and measure waste. In schools, we've found that having students lead on measurement helps to empower them while also establishing the cafeteria as a classroom.

Once there is an understanding of what is being wasted, and where and how that waste is occurring, interventions to drive behavior change can begin to be implemented. Data enables organizations to make more effective plans to reduce waste. As part of this recent

study, 46 schools performed audits over 222 audit days throughout the second half of the 2018-2019 school year. From the time of the first audits to the end of the school year, food waste was reduced by 3% per student on average across all participating schools (elementary, middle and high school), with a 14.5% reduction in elementary schools alone. This reduction happened within a very short period and with virtually no formal waste reduction interventions.

School size varies widely across the US, but for a school of 750 students, this equates to an average savings of food costs alone of \$1,321 per school over the course of a school year for a 3% reduction in waste, or \$6,387 for a 14.5% reduction. At a time when one in six children in the US face hunger<sup>5</sup> and nearly one in five children in the US are obese<sup>6</sup>, this money could be reinvested back into schools to help improve nutrition and educational programming.

FOOD WASTE COULD BE  
**\$1.7**  
BILLION  
EVERY SCHOOL YEAR

1 This study only evaluated student plate waste and did not assess back-end waste in food preparation operations.

2 <https://nces.ed.gov/fastfacts/display.asp?id=84>

3 <https://fns-prod.azureedge.net/sites/default/files/resource-files/slsummar-9.pdf>

4 [https://nces.ed.gov/programs/statereform/tab5\\_14.asp](https://nces.ed.gov/programs/statereform/tab5_14.asp)

5 <https://www.nokidhungry.org/who-we-are/hunger-facts>

6 <https://www.cdc.gov/healthyschools/obesity/facts.htm>



Milk is an iconic part of the NSLP, and milk waste represents a loss of nutrition with a high environmental and financial cost. Applying our waste estimates to nationwide numbers, **we estimate 45M gallons of milk are wasted on average every year across the country, totaling up to \$138M.** In addition to the wasted money and resources, milk thrown away in the garbage makes trash disposal more costly and difficult due to liquid weight and rodent infestation.

While there are many reasons for milk waste, one of the primary reasons appears to be confusion around the NSLP reimbursement requirements. In many cases, students are given milk whether they want it or not, as it's thought to be a requirement for reimbursement. Though milk is one of the five components that must be offered, students do not need to take it in order to have a complete and reimbursable meal. However, this provision is not clearly understood by school and cafeteria staff, teachers and aides, who often insist that all students take milk anyway. As a result, a lot of full or nearly full cartons wind up in the trash. Furthermore, in some cases, milk is also the only available beverage option.

Based on WWF's study, there was a significant difference in the amount of milk wasted depending on the way it was served. Milk served in cartons resulted in an average of 155 cartons wasted per student per year, whereas milk served in either jugs or dispensers resulted in an average of 67 and 27 cartons wasted per student per year, respectively. While the number of schools with dispensers and jugs was small relative to the total sample, these results are a clear demonstration that

alternative forms of milk delivery have the potential to significantly reduce waste.

Another driver of milk waste is the amount of milk served. Some students may only want a little bit of milk, but because most schools serve 8 oz cartons, much ends up wasted. Clackamas County, Oregon implemented a successful milk dispenser program, which reduced milk purchasing by 40% while simultaneously increasing milk sales by around 40%.<sup>7</sup> With milk dispensers, students were able to decide how much milk they wanted and drank more of it as they were able to control how much they got. Furthermore, trash disposal costs were significantly reduced due to the lack of cartons and additional liquid weight (\$1,970 annual reduction for Olympia High School in Washington; \$750 annual for Washington Middle School<sup>8</sup>). While milk dispensers may not be a viable option for every school - given varying cafeteria infrastructure and staffing, bulk purchasing options, and other challenges - and not all schools may achieve the same level of results, Clackamas County represents a strong argument for the economics of switching to dispensers.



<sup>7</sup> <https://www.clackamas.us/recycling/milk.html>

<sup>8</sup> <https://newfoodeconomy.org/milk-carton-dispenser-food-waste-usda-school-unch-nsfp-oregon-washington-olympia-vancouver/>

# INVESTING SAVINGS FROM FOOD WASTE REDUCTION



The issue of food waste in cafeterias is not an implication that school food management is fiscally irresponsible, but rather, it is indicative that food preparation, delivery, and student interaction can be rethought. Measuring food waste in schools provides a critical opportunity to engage with students about nutrition, the environmental impacts of food, growing and preparing food, the intrinsic value of food, and why food waste is an urgent issue. Savings resulting from minimizing wasted food in schools can be critically re-invested into other dietary and educational programs. The options are numerous, but examples include **Farm to School**, the **Good Food Purchasing Program**, and **investment in composting, staffing, and training**. These represent excellent options that have shown tangible results in improving nutrition and education, as well as freeing resources to be used to achieve other critical impacts.

## FARM TO SCHOOL



*“Farm to school is one of many tactics and resources that USDA makes available to help schools successfully serve healthier meals to kids. Farm to school partnerships have a proven track record of encouraging kids to try, like and eat more healthy foods and creating new market opportunities for the farmers that grow them.”*  
– Tom Vilsack, former US Secretary of Agriculture

Farm to School (F2S)<sup>9</sup> has a proven model of connecting schools to local and regional farmers and ranchers in order to improve access to nutritious local food while bolstering local economies and forging relationships within a community between schools and local producers. Components of the program include procurement, school gardens, and education, or any combination of the three. By combining education with improved access to local food, students grow to appreciate where their food comes from and how it was produced, ideally leading to less waste and better, more informed food choices that students can carry into adulthood.

### Farm to School Sample Benefits<sup>10</sup>

Students	<ul style="list-style-type: none"><li>Increased fruit and vegetable consumption +0.99 to +1.3 servings per day</li><li>Overall improvement in both grades and test scores (K-12)</li><li>Average meal participation increase of 9% (range 3% to 16%)</li><li>Lowers school meal program costs</li></ul>
Participating farmers and producers	<ul style="list-style-type: none"><li>Average income increase of 5%</li></ul>
Community	<ul style="list-style-type: none"><li>\$0.60-\$2.16 economic activity in local economy generated for every \$1 spent</li><li>Each new farm to school job contributes to the creation of additional 1.67 jobs</li></ul>
Environment	<ul style="list-style-type: none"><li>Reduced food waste of local food, both on the production side as well as plate waste</li></ul>

<sup>9</sup> <http://www.farmtoschool.org/about/what-is-farm-to-school>

<sup>10</sup> <http://www.farmtoschool.org/Resources/BenefitsFactSheet.pdf>

The above table represents a few of the tangible results demonstrated by F2S. Harder to quantify are the positive environmental impacts, lifelong lessons learned by students to try new foods and understand how food is produced, benefits of healthier diets, and greater learning opportunities for educators and school staff. By reducing waste, schools can invest the money saved into F2S, improving student lives in tangible, measurable ways. Furthermore, one of the benefits of F2S is the reduction of student plate waste<sup>11</sup>, which makes it a mutually reinforcing program; by reducing waste, schools can invest in F2S, while through the program, waste is further reduced.

The USDA offers planning, implementation, and training grants for schools looking to start or continue F2S programs, with grants ranging from \$20,000 to \$100,000. For the 2015-2016 school year, the most recent for which USDA has a grantee report, \$120M was requested from applicants with approximately \$25M awarded.<sup>12</sup> This demonstrates a much larger demand for F2S programming than current funding can support, proving that schools are eager to invest in these initiatives but often lack the means to do so. If schools nationwide were able to reduce food waste by a conservative 3% with minimal effort, based on our study results, and the savings were invested in F2S, that would fill more than half the gap (\$95M gap vs \$52M savings) in funding requested versus granted, allowing F2S programming to grow and expand, resulting in cascading impacts for schools, producers and communities. If waste were instead reduced by 6%, that would more than cover the gap.

In our study, we found that, in many cases, one size fits all solutions won't work across all schools given different scales, facility layouts, state and local laws and cultural differences. One of the benefits of F2S is the ability to tailor solutions to the appropriate local context and scale up efforts once a foundation is built. USDA awards for F2S in 2018 ranged from as small as \$18,750 in Georgia for a Farm to Early Care learning conference to \$100,000 in Michigan to strengthen supplier relationships, buy more local food, hire a food service worker and allow for equipment purchasing to process local food.<sup>13</sup> Investing savings from reduced student food waste will allow schools to pursue F2S opportunities aligned with the savings available, as well as their local context, to achieve strong results for student nutrition and education, farmer incomes, and local economies.



Photo courtesy of the Maryland Department of Agriculture [www.mda.maryland.gov](http://www.mda.maryland.gov)

<sup>11</sup> <https://www.fns.usda.gov/pressrelease/2015/029215>

<sup>12</sup> [https://fns-prod.azureedge.net/sites/default/files/f2s/USDA\\_GranteeReport\\_O.pdf](https://fns-prod.azureedge.net/sites/default/files/f2s/USDA_GranteeReport_O.pdf)

<sup>13</sup> <https://fns-prod.azureedge.net/sites/default/files/f2s/FY18ListofAwards.pdf>

# GOOD FOOD PURCHASING PROGRAM



Another program with proven outcomes in which savings from reducing food waste can be invested is the Good Food Purchasing Program (GFPP). The GFPP focuses on improving procurement through 5 pillars: local economies, nutrition, valued workforce, environmental sustainability, and animal welfare. The program helps set a baseline standard for each pillar and enables institutions to set goals and track progress against the goals. Furthermore, the various pillars provide additional educational opportunities for students to learn about food systems and how they impact health, people, and the planet.

**The Los Angeles Unified School District began implementing GFPP practices in 2012 and has seen healthier products in schools, \$12M worth of purchasing redirected to local sources, higher wages for farm workers, 150 food chain jobs created and more.**<sup>14</sup> Within the first two years of implementation, fruit and vegetable purchases skyrocketed to 75% local from 9% previously.<sup>15</sup> As with F2S, not only does this improve nutrition in schools, it forges strong community bonds and builds resilience in local economies. Though Los Angeles has the advantage of more local fruit and vegetable production than many parts of the US, cities including Cincinnati, the Twin Cities, Chicago, Boston and more have adopted the GFPP, demonstrating that appropriate adaptations can be made for purchasing policies even when locally available produce may vary.

The GFPP differs from F2S in that the institutions implementing GFPP practices must make a commitment to meet baseline standards, be transparent about their supply chain, incorporate GFPP guidelines into RFPs and establish mechanisms to ensure compliance and demonstrate progress over time. While it still provides flexibility for schools in setting baseline standards, the commitment required is more robust, giving schools an opportunity to teach students about responsibility and the power of individuals and organizations to make progress towards goals that affect society as a whole. Educational opportunities go beyond the important fundamentals of nutrition and agriculture to workforce, animal welfare and economic issues, providing ample opportunities for schools to tailor curriculums based on priorities for their region.

**FRUIT AND VEGETABLE  
PURCHASES  
SKYROCKETED  
TO 75%  
LOCAL**

<sup>14</sup> <https://goodfoodpurchasing.org/faq/>

<sup>15</sup> <https://goodfoodpurchasing.org/tracking-the-ripple-effects-of-las-good-food-purchasing-program/>

## INVESTING IN SCHOOL INITIATIVES



While F2S and the GFPP represent structured programs that schools can participate in, there are myriad ways in which savings from reductions in student plate waste can be applied to further nutrition and education. Composting, staffing, and training are just a few examples of opportunities

### COMPOSTING, STAFFING, AND TRAINING LEVERAGE BETTER OUTCOMES.

for schools to leverage better outcomes in health and education for students.

Some of the schools in the WWF study composted, while others did not or were unable to do so due to policies, lack of resources, or market availability. Composting (or a landfill diversion program) provides a great educational opportunity while also reducing greenhouse gas emissions by avoiding food going to landfill. Through savings, schools can work with local composting groups or farmers to pick up compost, or establish their own operation linked to a school garden.

Though most schools were enthusiastic participants in audits and the Food Waste Warrior curriculum, the responsibility it added on already-overburdened teachers was significant. Another way to reinvest

savings from food waste reduction is in school staff, either as a dedicated staff person to work on environmental issues, bonuses for teachers who organize and conduct audits and other waste reducing activities in addition to their regular duties, increasing back-end kitchen staff, or any number of other staffing gaps according to need. Inspiring teachers have tremendous power to influence student behavior, and there are few ways to reinvest savings that will provide a better return on investment.

For many of the schools in our study, lack of clarity on policies for Offer Versus Serve (OVS) and share tables led to poor implementation that reduced their impact. By offering enhanced training for teachers, students, administrative and back-end staff, full advantage can be taken to reduce waste and hunger through share tables, ensure appropriate nutrition while reducing waste through correctly applied OVS procedures, and any number of other areas. Training funds could also be directed towards teaching valuable leadership skills, training younger students on these concepts, or inspiring student-led initiatives to increase signage and audits as occurred in some of our project schools.

Please Try to waste less food! Thank you and BE A FOOD WASTE WARRIOR! 😊



## LESSONS LEARNED IN THE CAFETERIA CAN TRANSFORM STUDENTS INTO BETTER ENVIRONMENTAL STEWARDS FOR THE FUTURE

Schools that reduce food waste can reinvest the money saved to better achieve their mission of educating students while simultaneously improving both nutrition delivery and local economies. The analyses reported here are just the beginning of what can be done to reduce food waste. If schools work together through knowledge-sharing platforms, they can all learn more quickly than if each of them attempts it on their own.

Lessons learned in the cafeteria can also be as impactful as a traditional classroom and can transform students into better environmental stewards for the future. There are many ways to reinvest savings from reductions in food waste, allowing schools maximum flexibility to encourage the greatest possible impact in their local environment. Furthermore, many of the recommended reinvestments are mutually reinforcing, often providing multiple benefits that build on one another. Reducing food waste in schools isn't just a good thing to do for the environment; it also makes strong economic sense.

## CONTACT:

### WORLD WILDLIFE FUND

#### **Katherine Devine**

Director, Business Case Development  
Markets Institute  
Katherine.Devine@wwfus.org

#### **Pete Pearson**

Senior Director, Food Loss and Waste  
Pete.Pearson@wwfus.org

# APPENDIX 1: CALCULATIONS FOR NATIONWIDE FINANCIAL IMPACTS

For this study, we did not have detailed purchasing data from schools for the meals prepared during the research. As a result, the below proxy measurements were used to estimate the financial impact of student plate waste.

## METHODOLOGY

Plate waste was measured in pounds. In order to estimate financial implications, the average weight of school lunches, as well as the average cost, were estimated.

## AVERAGE COST OF SCHOOL LUNCH

USDA's School Nutrition and Meal Cost Study, Volume 3<sup>16</sup> estimates the mean cost of an average NSLP lunch is \$3.66. Of that \$3.66, 45% was estimated to be food-related costs (\$1.65). For the purposes of our calculations, we only used the food cost.

## AVERAGE WEIGHT OF SCHOOL LUNCH

Using the NSLP guidelines as a basis, reimbursable lunches must be comprised of at least 3 of 5 components (meat/meat alternate, grain, vegetable, fruit, fluid milk), one of which must be fruit or vegetable.<sup>17</sup> By taking weight/required serving, and averaging weight for reimbursable meals with at least 3 components, we reach an average of 1.1 pounds for school lunch. Actual weights will vary based on what meals are served, as well as which components are selected, but this serves as a proxy measurement to extrapolate national averages.

## Nationwide Financial Impacts of Food and Milk Waste

▶ Average cost of school lunch (food only)	\$1.65
▶ Average weight of school lunch (lb)	1.1
▶ Average cost of school milk (8 oz/0.05 lb) <sup>18</sup>	\$0.19
▶ Food waste/student/year (lb)	39.2
▶ Milk waste/student/year (carton/8 oz)	28.7
▶ Average days in school year	180
▶ Meals served by NSLP (SY 2018)	4,864,700,000
▶ Cost food waste/year (total)	\$1,738,367,769
▶ Cost milk waste/year (total)	\$138,270,455

<sup>16</sup> <https://fns-prod.azureedge.net/sites/default/files/resource-files/SNMCS-Volume3.pdf>

<sup>17</sup> <https://fns-prod.azureedge.net/sites/default/files/cn/MealPatternsSY19-20.pdf>

<sup>18</sup> Calculated using average dollars per carton of milk purchased during the school year in project schools.