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# Recess Before Lunch: Fryberger Elementary Case Study

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## Recess Before Lunch

In the recent years we have seen a shift in focus toward improving our students' health to help fight the early onset of obesity. With the Healthy Hunger-Free Kids Act (HHFKA) in 2010, the Farm to School Program was officially formed and funded within the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) [4]. Farm to School aims to: 1.) increase the consumption of fruits and vegetables among K-12 students, 2.) better connect students with the source of their food through food literacy programs, and 3.) support local farmers by increasing local procurement. Not only is it vital to provide our students with healthy food choices, but we must also ensure that they are also consuming the necessary nutrition they need. It is from this Farm to School Program that Recess Before Lunch came into fruition.

Too often we see our students taking only a few bites of their lunch in order to rush out to recess to maximize their play time. The Recess Before Lunch (RBL) program, also known as "Eat Before Play," is shifting the traditional thinking of lunch scheduling. Recess Before Lunch is a Farm to School program that aims to increase the nutritional intake by strategically scheduling, as the

name implies, recess before lunch. This simple change has proven to benefit and improve health, behavior, social skills, academic achievement, and the child as a whole.

18,670 pounds of food is wasted annually among elementary school children in America [3]. When children are prioritizing their playtime over their meals, they are unintentionally creating plate waste. When food is going to the trash instead of the bellies of our children, students are missing out on important nutrients necessary for good health and proper growth. With the RBL schedule, not only are students eating more of their food, research shows that they are also consuming more fruits and vegetables. This may be due to the fact that students who have recess scheduled before lunch work up an appetite during recess and are hungrier by lunchtime. In contrast, students who have lunch scheduled before recess may find it uncomfortable to exercise immediately after eating.

Not only does food impact physical health, it also impacts mental health, academic performance, social skills development, and behavior. Therefore, when students are not getting the proper nutrition they need, this

also affects their overall wellness. Good nutrition gives children a head start by promoting growth, good health, learning, and reduces risks of chronic diseases. It is key to remember that healthier students are better students. The Center of Ecoliteracy and other research, such as a Boston Puerto Rican health study, found that better nutrition is linked with higher academic achievement, increased cognitive function and memory [7]. Undernourished children are more likely to repeat a grade and require more special education and mental health services [3]. Students that have RBL are more likely to consume their food and in turn more nutrition. Students can also avoid upset stomachs from exercising immediately after a meal and headaches from skipping meals to rush out to recess. Fewer nurse visits after recess means that students are spending more time in the classroom instead of in the nurse's office. RBL has also shown to lower the amount of discipline referrals and increase in-class focus after lunch. A study done in Kaneohe Elementary School in Hawaii demonstrated that the RBL schedule helped improve discipline referral problems by shortening lunch line wait time, which the elementary principal had observed where many discipline problems were occurring [5]. Since students are using lunchtime as a cool-down period after recess, students are more ready to return to class work after lunch, as opposed to taking time out of class to settle down after the recess break [1]. Overall, RBL can benefit students as a whole and promote student wellness.

Although RBL has proven to have many benefits for students and schools, there still remains some pushback. One of the biggest lessons learned is that making the switch to

Recess Before Lunch is a change that requires commitment. RBL, as any other program, needs proper time and planning to ensure that the program can run the most efficient way possible for the specific school site. Some also worry about the staffing required for recess/lunch supervision, the large number of students enrolled in their site, or handwashing. These concerns can all be easily addressed with the proper support. The great thing about RBL, is that it is an adaptable program. Each school site can adjust the RBL schedule to best fit their campus. As we've experienced, in having a champion committed to student wellness, the benefits of RBL greatly outweigh the challenges.

### **Fryberger Elementary School**

Fryberger Elementary School (Fryberger), in the Westminster School District has been a champion in promoting health and wellness among their students. From healthy food murals to Smarter Lunchroom Strategies and now most recently Recess Before Lunch. With their champion principal, Dr. Kiouses, rising up to the challenge, Fryberger made the switch to RBL near the end of their 2016-2017 academic school year. With the support of their faculty and staff, and technical assistance from Orange County Food Access Coalition (OCFAC), Fryberger continued to implement RBL for the following school year.

Fryberger Elementary School had an enrollment of 470 students during the 2016-2017 school year and 433 students in the 2017-2018 school year. Of these students, about 78.7% qualify for free and reduced school meals in the 2016-2017 school year. Due to food insecurity, many children in America rely heavily on school

food for their main source of balanced and nutritious meals [7]. Although nutritious meals are more readily available, ensuring that students actually eat their meals is another story. This is where RBL and Fryberger shine. With the switch to RBL, Fryberger continues to blaze forward with student health and wellness priorities.

### Methodology

Three plate waste studies were conducted to analyze the immediate effects of RBL during the first year of implementation. Since plate waste was only collected three times throughout the school year, multiple components and assessments were incorporated to gather as much data as possible. These main components include: 1.) general plate waste study, 2.) fruit and vegetable consumption analysis, 3.) Smarter Lunchroom Assessments, and 4.) RBL teacher/staff surveys.

All plate waste studies measured uneaten food based on a quarter-waste method, while all beverages were weighed for data collection during each lunch period. Smarter Lunchroom Assessments were conducted

before students went through the lunch line and also while students went through the lunch line to assess all aspects of the lunch period. Along with plate waste data, fruit and vegetable count was also analyzed to observe if RBL demonstrated an effect in increasing fruit and vegetable choice and consumption. A teacher/staff survey was sent out twice to gauge the staff's experience with and opinion on the switch to RBL. The first survey was sent during the beginning of the 2017-2018 school year with the initial implementation of RBL, and the second was sent at the end of the 2017-2018 school year after a year of RBL implementation.

The initial plate waste study (pre-test) was done prior to the switch to the RBL schedule (May 2017). The second (mid-test) took place near the start of the 2017-2018 school year (November 2017), and the last (post-study) was performed toward the end of the 2017-2018 school year (April 2018). Collected data was then processed and compared. An unpaired t-test was used to determine if plate waste data was statistically significant.

### Results

**Table 1 - Pre-Test Plate Waste Data Collected on May 11, 2017**

Food Item	Grade 1 % Waste	Grade 2&3 % Waste	Grade 4&5 % Waste	Total Waste % per Item
Teriyaki Beef Dippers	50.31%	53.75%	32.28%	44.05%
Fluffy Rice	80.00%	82.43%	73.58%	78.19%
4-way salad	62.50%	50.00%	55.47%	56.02%
Grape Tomatoes	83.33%	70.83%	--*	77.08%
Carrot Sticks	65.63%	75.00%	80.00%	74.11%

Broccoli	59.38%	100.00%	12.50%	51.79%
Pineapple	77.08%	62.50%	80.00%	74.17%
Orange	81.25%	53.26%	56.91%	61.50%
Total Waste % per Lunch Period	68.71%	63.81%	53.98%	60.71%

\*\*"--" indicates that the food item was offered, but was not chosen amongst the plates that were randomly assessed.

**Table 2 - Mid-Test Plate Waste Data Collected on November 9, 2017**

Food Item	Grade 1&2 % Waste	Grade 3&4 % Waste	Grade 5 % Waste	Total Waste % per Item
Pasta with Meat Sauce	57.50%	57.19%	55.63%	56.99%
Cheese Breadstick	27.63%	14.24%	21.25%	21.14%
Vanilla Yogurt	40.15%	27.78%	31.25%	33.33%
Romaine Lettuce	46.43%	81.25%	48.08%	53.13%
Grape Tomato	91.67%	25.00%	25.00%	53.37%
Orange Slice	45.16%	32.26%	31.25%	36.89%
Pineapple	86.36%	100.00%	75.00%	85.71%
Broccoli	66.67%	68.75	NA**	67.50%
Total Waste % per Lunch Period	45.69%	35.27%	38.14%	40.18%

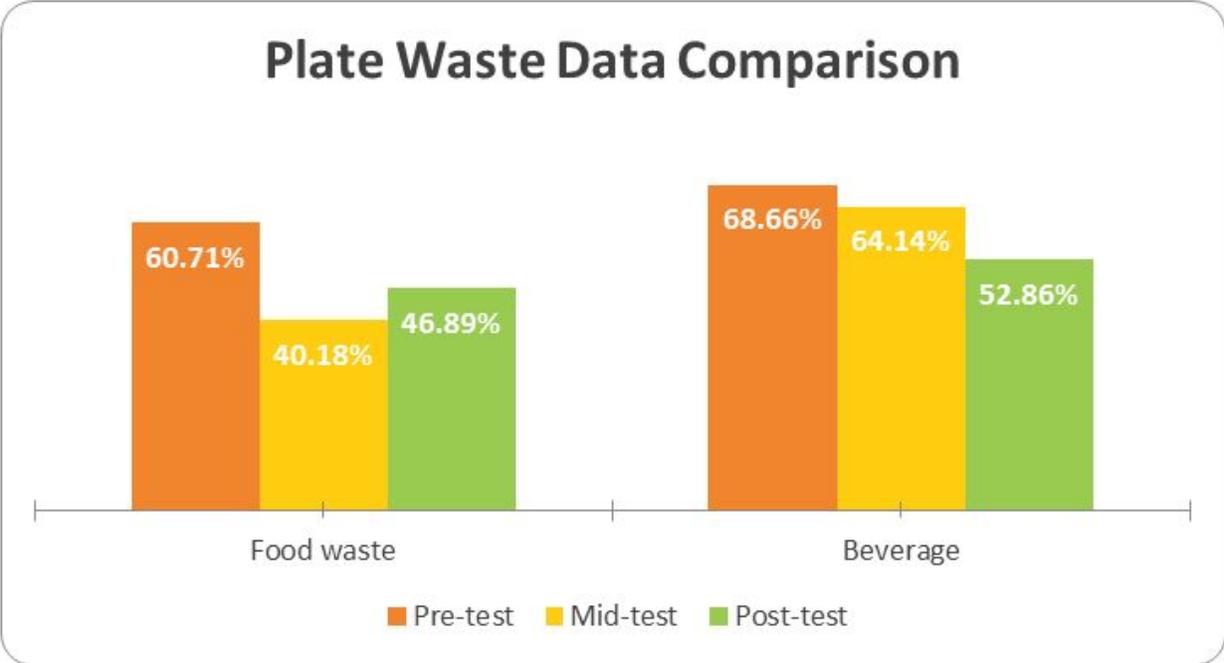
\*\*"N/A" indicates that the food item was not offered in the given lunch period.

**Table 3 - Post-Test Plate Waste Data Collected on April 19, 2018**

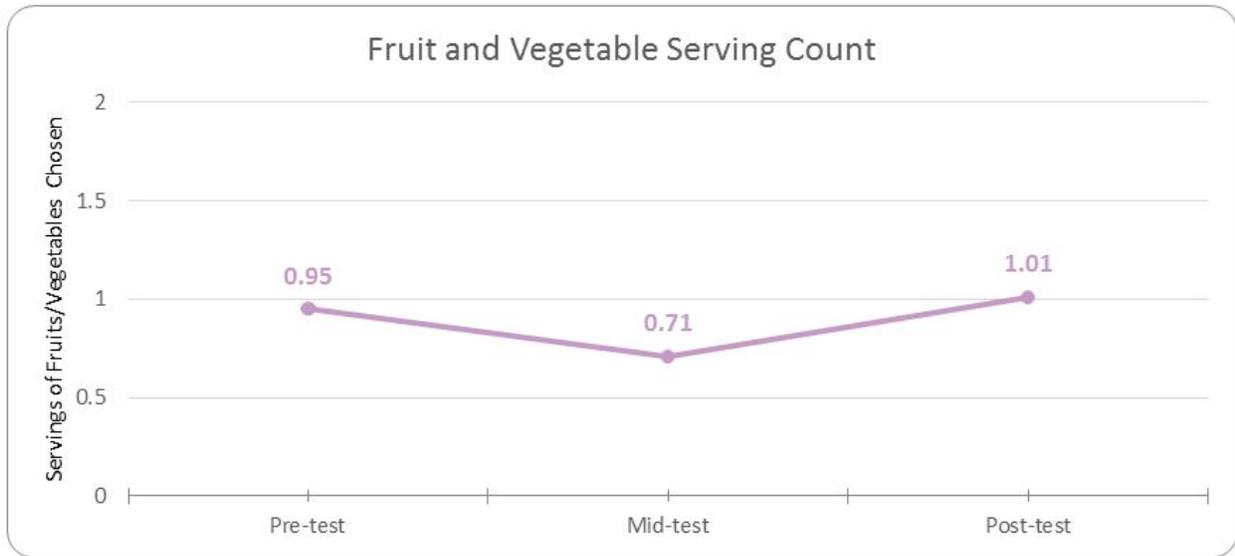
Food Item	Grade 1&2 % Waste	Grade 3&4 % Waste	Grade 5 % Waste	Total Waste % per Item
Teriyaki Beef Dippers	35.24%	47.50%	20.63%	37.19%
Fluffy Rice	65.36%	67.50%	49.38%	63.05%

4-way salad	32.50%	60.00%	32.14%	38.64%
Corn	65.48%	75.00%	25.00%	65.63%
Carrot Sticks	65.00%	58.33%	62.50%	61.54%
Broccoli	41.67%	37.50%	50.00%	41.67%
Pineapple	54.69%	32.14%	31.25%	45.37%
Orange	38.02%	34.21%	34.62%	36.11%
Total Waste % per Lunch Period	47.77%	52.84%	33.20%	46.89%

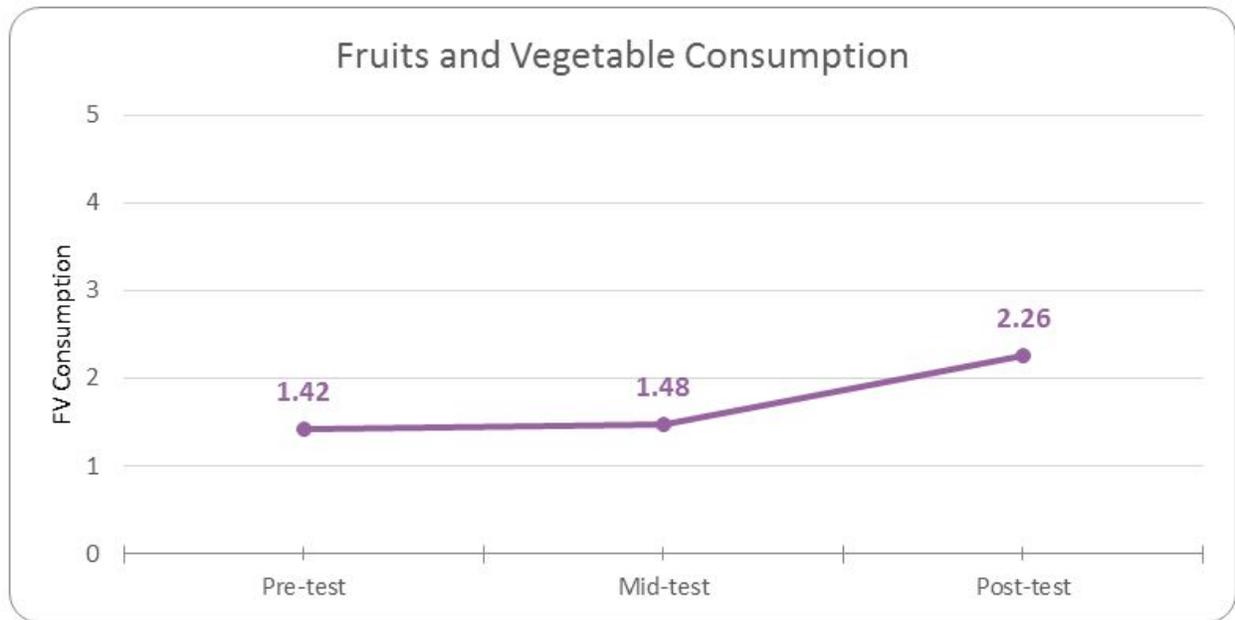
**Graph 1 - Plate Waste and Beverage Waste Data Comparison**



**Graph 2 - Fruit and Vegetable Consumption**



**Graph 3 - Fruit and Vegetable Consumption**



Fruit and vegetable (FV) consumption was calculated by subtracting FV waste from FV total. Trays were given a score between 1 and 5. 1 - 25% of FV were eaten, 2 - 50% of FV were eaten, 3 - 75% of FV were eaten, 4 - 100% of FV were eaten, 5 - More than one serving of FV was eaten

**Table 4 - Unpaired t-test for Plate Waste Data**

Plate Waste Data Significance			
Study Comparison	Pre-Test & Mid-Test	Pre-Test & Post-Test	Mid-Test & Post-Test

P-value	0.0000000000000184 621259	0.0000001510654807	0.007212802289
Significant (Yes/No)	Yes***	Yes	No

\*\*\*P-value ≤ 0.005

**Table 5 - Unpaired t-test for Fruit and Vegetable Consumption**

Fruit and Vegetable Consumption Significance			
Study Comparison	Pre-Test & Mid-Test	Pre-Test & Post-Test	Mid-Test & Post-Test
P-value	0.7274571349	0.00008648343148	0.0003772863706
Significant (Yes/No)	No***	Yes	Yes

### Discussions

Plate waste data was collected on three days during the school year. The initial data collection was done before RBL intervention, while the rest of the data collection was done after RBL intervention. Plate waste studies were scheduled on days with the same, or mostly similar, main entrées to keep data collection consistent. Pre-test and post-test had the same main entrée and mostly the same menu, however, the main entrée for the mid-test unavoidably deviated from the other two studies. Although results were still positive, this deviation did contribute to a slight difference in results (see below section). After data was analyzed, we found that there was a significant decrease in student's total food waste and a significant increase in students' fruit and vegetable (FV) consumption after RBL implementation.

### Food Waste

Before RBL intervention, students were wasting more than half of their lunch meal, with an average plate waste of 60.71%. After eight months of implementation of the new lunch schedule, overall food waste

dropped down to 46.89%, meaning that students are consuming about 14% more of their food. Students' plate waste of meat entrée (teriyaki beef dippers) decreased from 44.05% to 37.19%. Plate waste data showed that there was a significant decrease in students' rice waste in particular. Students' plate waste of the rice entrée decreased from 78.19% to 63.05%.

### Fruit and Vegetable Consumption

Because each student can choose at least two types of fruits and vegetables from Fryberger's salad bar, the total amount of students' fruit and vegetable consumption was compared. Before RBL intervention, students consumed an average of 35.50% of one serving of a fruit or vegetable. After the implementation of RBL, students' average FV consumption increased to 56.50% of one serving of fruit and/or vegetable. There was a 59.15% increase in students' FV consumption at Fryberger. The plate waste study found that students are more likely to choose more fruits and vegetables when having lunch after recess. When students had the traditional lunch before recess schedule, the average

number of fruits and vegetables they chose was less than one, implying that some students did not choose any fruit or vegetable for lunch. With RBL, students were more likely to choose at least one fruit or vegetable, and eat more fruits and vegetables during lunch. Even though there is a significant increase in Fryberger students' fruit and vegetable consumption, there is still room to improve student fruit and vegetable consumption.

#### Mid-Test Plate Waste Study

As previously mentioned, the mid-test had the greatest difference in menu items compared to the pre-test and post-test, leading to some variation in results. Based on the plate waste results, the mid-test had the lowest plate waste percentage. Students were also less likely to choose a fruit and vegetable compared to the pre-test. The average number of servings of fruits and/or vegetables students chose was 0.71 (a lower average compared to the pre-test), indicating that there were fewer students who chose a fruit or vegetable during lunch compared to the pre-test. Although students chose fewer fruits/vegetables during lunch in the mid-test, students that did choose a fruit or vegetable consumed more of their fruit/vegetable compared to the pre-test. The serving of yogurt in the mid-test may have also contributed to the increase in FV consumption since many students would eat their fruit with their yogurt as seen on various trays during the plate waste study.

Along with differing menu items, the pre-test and post-test were also done during spring semesters, while the mid-test was done during fall semester, which may have also played a role in differing results due to weather. People are more likely to consume

hot food more readily in cold weather compared to warmer weather. The cheese breadstick and pasta entrée was also more popular among students compared to the teriyaki beef dippers and rice entrée affecting plate waste results. There are various external factors that might have affected the data from the mid-test.

#### Teacher/ Staff Survey Results

To learn about the experiences of teachers/staff with RBL, a survey was sent out twice during the school year. The initial survey was collected at the start of the 2017-2018 school year at the beginning stages of RBL implementation. The second survey used for comparison was taken towards the end of the 17-18 school year after about a year of implementation. These surveys inquired about student behavior/focus after lunch, number of discipline referrals after lunch, number of nurse visits after lunch, previous experience with RBL, difficulty in transitioning to RBL, lunch schedule preference and other comments or concerns.

Teachers were asked to rate their students' behavior in class post-lunch on a scale from "1, Very Rowdy" to "5, Very Calm." In the initial survey, majority of respondents rated their students a "3, No notable change," with 28.6% rating their students a "4, Calm" after lunch. The follow-up survey had slightly differing results. 41.7% of respondents rated their students' behavior a "3," 41.7% rated a score of "4," and 16.7% experienced some rowdier student behavior and rated their students' behavior a "2, Rowdy." Along with student behavior, teachers/staff were also asked to evaluate the number of discipline referrals post-lunch after the switch to RBL. At the beginning stages of RBL, 57.1% of

teachers said there was “No notable change” in the number of discipline referrals, and 42.9% said that there were “Fewer discipline referrals after lunch,” after the switch to RBL. Results from the second survey portrayed some further improvement. 33.3% said there was “No notable change,” 33.3% noted that there were “Fewer discipline referrals after lunch,” and 33.3% stated that there were “Hardly any discipline referrals after lunch.” Overall, with the implementation of RBL, teachers/staff noted some slight improvements to student behavior and a decrease in the number of discipline referrals after lunch.

Both surveys also inquired about student focus upon returning to the classroom from lunch on a scale from “1, Very distracted,” to “5, Very focused.” In the first survey, teachers rated their students’ focus by the following: 14.3% ranked “1,” 71.4% ranked a “3,” and 14.3% ranked a “4.” In the second survey after longer RBL implementation, teachers noted their students’ focus as the following rates: 8.3% ranked a “2,” 50% ranked “3,” and 41.7% ranked a “4.” Based on these reportings, students were more focused after returning from lunch with the switch to RBL.

Teachers/staff were asked to evaluate the number of student nurse visits after lunch. The initial survey portrayed that 57.1% of teachers noted that there was “No notable change,” while 42.9% stated that they noticed “Fewer nurse visits after lunch. The second survey found that 66.7% found “No notable change,” and 33.33% indicated “Fewer nurse visits after lunch.” For majority, it seems as though most teachers/staff did not notice a huge change

in the number of nurse visits after lunch, however, the rest of the teachers/staff noted fewer visits to the nurse with no teachers/staff noting any increase in nurse visits.

From the surveys, the majority of teachers/staff had previously heard of RBL, and only about 33.3% had not heard of RBL prior to the transition. Teachers and staff were asked to rank the difficulty in transitioning to RBL. The surveys found that 83.3% found it “Easy” or “Very Easy” to make the switch to the RBL lunch schedule. 8.3% noted that it was neither easy nor difficult, with another 8.3% claiming that the transition was “Difficult.” After a year of RBL implementation we found that 33.3% of teachers/staff preferred the RBL lunch schedule, 25% preferred the traditional lunch schedule, and 41.7% had no preference. With this being the first year of RBL implementation, it is natural to see a mix of preferences. There are still challenges and kinks to work out to better adjust RBL to Fryberger’s school site. However, based on the results of these surveys, we’ve found that many teachers/staff see some improvement in their students’ focus, behavior, and health and would like to continue RBL.

### **Limitations**

As aforementioned, there were a few limitations when conducting the plate waste study which include: differing menu items, change in lunch periods, and beverage data collection methods. Only two out of three plate waste studies had the same menu items. The mid-test’s variation in menu affected that study’s results as seen on previous result graphs. Lunch periods were also changed after the implementation of

RBL to better suit Fryberger's school site. Although this is often done when schools make the transition to RBL; this change was not factored into the original methodology of the plate waste study. The change in lunch periods hence switched which students were eating at a certain time, making it difficult to directly compare individual plate waste by grade (i.e. lunch period one originally only had grade 1, but after RBL, lunch period one then had both grades 1 and 2. Grade 2 then could not be directly compared to the pre-test grade 2 data since they were eating at different times compared to the pre-test). Therefore we could not investigate the association between every student's grade and plate waste. This change was accommodated with updated methodology during the post-study to more accurately collect and compare data. Lastly, beverage waste was measured for each type of beverage per lunch period. Unfortunately, individual beverage data could not be used in the final data analysis due to confounding bias, including measure method and faulty measuring instruments. This challenge limited collected data to overall beverage waste per lunch period instead of average individual waste. In future studies, individual beverages waste should be measured using a more sensitive scale to determine on average how much students are consuming of their milk/juice.

### **Final Conclusion and Next Steps**

After having Recess Before Lunch implemented for one school year, students at Fryberger Elementary School have improved their eating habits. With RBL, students consumed 13.82% more of their lunch meal and were more willing to eat fruits and vegetables compared to when

they had the traditional lunch schedule. Teacher/staff surveys found that teachers/staff noticed an improvement in student behavior and focus when returning to the classroom after the switch to RBL. Although teachers did not note a noticeable change in the number of nurse visits post-lunch, they did state there was quite a decrease in the number of discipline referrals. Along with these findings, 33.3% of teachers/staff preferred the RBL lunch schedule of the traditional schedule.

Despite a successful first year with RBL, there is always room for improvement. The CDC states that children's daily fruit consumption should be 1 to 2 cups, and daily vegetable consumption should be 1 to 3 cups. Children's eating patterns are associated with their eating habits later in life, hence the importance of ingraining healthy eating habits in children now at this key developmental stage [2]. Higher fruit and vegetable consumption is also associated with lower risk of cardiovascular disease later in life [6]. All schools should take more action to encourage students to consume more fruits and vegetables, and without a doubt Fryberger will continue to push forward with this effort.

As it is their first year of RBL, OCFAC will continue to support and work with Fryberger to work out some kinks and fine details of the program implementation to continue to improve the RBL process at their school site. We firmly believe that with continued application of RBL, students' eating habits will continue to improve. These positive changes will be essential for long-term health and wellness. With this, Fryberger Elementary School will continue to be trailblazers in student health and wellness.

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