



Lunch Time at School

How Much is Enough?

An Assessment of School Lunch Seat-Time in Seattle Public Schools

University of Washington School of Public Health, Nutritional Sciences Program, March 2015

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Team Members

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Executive Summary

Graduate students from the University of Washington School of Public Health Nutritional Sciences program partnered with the Seattle Public School District Nutrition Task Force in an effort to evaluate current elementary school lunch timing patterns.

Methods

Principal Survey: Principals from ten SPS elementary schools were invited to participate in an interview regarding school lunchtime policies and procedures. Eight principals engaged in a phone-interview conducted by two team members, with one member asking prepared questions and both members dictating.

Kitchen Manager Survey: Elementary kitchen managers from 68 SPS schools were asked to complete an electronically-delivered survey. The purpose of the survey was to investigate the manager's perceptions of school lunch time at their school. In total, 63 of the surveys were completed (92.6%).

Cafeteria Observation: A lunch time analysis was carried out at seven elementary schools in the Seattle Public School District. Team members randomly selected two elementary students per lunch period to observe and recorded key intervals of time (line time, seat time, ect.) for each student.

Plate Waste Assessment: Plate waste assessments were conducted at four elementary schools to observe the amount of food consumed and thrown away during the lunch period. A total of 498 students were randomly selected to participate in the survey, and visual assessments of the food was conducted before and after the lunch period by trained team members.

Key Findings

- **Six out of eight principals agreed a 20-minute lunch period was sufficient**
- **Schools with a higher eligibility for free and reduced lunch were reported to have less**

time to eat by elementary kitchen managers

- **Average total lunch time for the seven observed elementary schools was approximately 20 minutes. However, students only spent an average 13 minutes of the period eating lunch.**
- **Observations from the plate waste study indicated on average, 70% of vegetables and 50% of fruits were wasted.**

Recommendations to Improve School Compliance with Lunchtime Policy

- **Elevate the status of lunchtime.**
- **Increase the dialogue and collaboration between school administrators and Nutrition Service staff.**
- **Educate stakeholders (principals, teachers, nutrition services staff, etc.) on the importance of school lunch.**
- **Encourage a diverse coalition of stakeholders to advocate for lunchtime scheduling.**

Administrators and schools facing scheduling constraints may adopt the following recommendations to maximize lunch periods:

- **Schedule recess prior to lunch.**
- **Utilize more discrete recess cues.**
- **Train lunchroom supervisors to encourage positive eating behaviors in students.**
- **Emphasize the importance of giving students adequate time to get to the cafeteria.**

Together these recommendations give administrators a toolkit of options to maximize the time students have available to eat lunch.

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Introduction

Statement of Purpose

Based on current policy, there is concern that students in the Seattle Public School District currently may not have enough time to eat their lunch. To address this issue, University of Washington School of Public Health Nutritional Sciences graduate students partnered with the Seattle Public School District Nutrition Task Force in an effort to evaluate current elementary school lunch timing patterns. The assessment included the survey data from kitchen managers and elementary school principals, as well as observational cafeteria assessments, and plate waste evaluations. Information gathered was used to better understand current factors that influence school lunch time, and provide information to inform recommendations to Seattle Public Schools administration, Nutrition Services, and other stakeholders.

Project Goal

The goal of this project was to collect and analyze data on school lunch timing in an effort to provide research that can inform recommendations regarding policy for school lunch periods and structure.

Objectives

- **To assess current lunchroom conditions regarding seated time through observations. The conditions evaluated included: time spent getting to the cafeteria after the official start of lunch, time spent waiting in line, and total seated time.**
- **To assess factors that influence lunchroom conditions including number of lunch monitors present, number of lines, and number of registers.**
- **To collect professional opinions of kitchen managers about their experiences with school lunch including their best judgment on the amount of time students get to eat and if that amount of time provided is adequate.**
- **To determine attitudes of school administrators regarding current school lunchtime policy, as well as attitudes surrounding suggested policy proposals, through principal interviews.**
- **To inform future policy recommendations regarding school lunch timing and structure.**

The Importance of Adequate School Lunch Time

Positive school food environments and practices are essential for promoting healthy eating behaviors in children. Development of these behaviors is important for optimal health, growth, and intellectual development.¹ Additionally, healthful diets can prevent diet-related conditions such as undernutrition, iron deficiency anemia, and obesity. The United States Department of Agriculture (USDA) revealed that 71.5% of students in National School Lunch Program (NSLP)-participating schools received free or reduced lunches in 2014. However prevalence of undernutrition and obesity in this country has not changed significantly since 2003-2004. Currently undernutrition rates are at one percent, and obesity prevalence is 17%.² Current literature suggests that this steady trend may be attributed to the insufficient time provided to students for buying and eating lunch. Not only does this prevent students from eating full meals, it also negatively impacts their nutrient intake as they often resort to buying à la carte snacks, eating from vending machines or skipping lunch entirely.³

To promote continued improvement of Child Nutrition Programs, the Applied Research Division of the National Food Service Management Institute sponsored three studies to measure the seat-time among students. The studies examined if lunch periods were adequate by considering factors such as student travel, service, and cleanup.⁴ Although these studies provide insight into the time required for students to eat lunch, they do not take into account individual school's lunch hour policies and food service structure, possibly due to differences across states and districts. While current literature focuses primarily on the quality of food students consume, limited data is available regarding factors affecting school lunch schedules and their potential impacts on student eating behaviors.

Studies of School Lunch Times and Potential Outcomes

The Impact of Lunch Time on Nutrient Intake

The amount of time provided for lunch is an essential factor influencing whether a student selects nutritious food options. Therefore, lunch time directly impacts the nutritional status of

students, and evidence shows increased lunch time leads to improved nutrient consumption.⁵ In a study comparing the consumption patterns of two elementary schools in central Washington with differing lunch period lengths, investigators found significant differences. The students with a longer lunch period consumed more nutrients such as carbohydrates, protein, fat, vitamin A, vitamin C, iron and calcium. Students with a longer lunch period also consumed a higher percentage of the foods offered and therefore also more calories, compared to the children with the shorter lunch period.⁶

These results are in alignment with a statement made by the American Academy of Pediatrics asserting that students need sufficient time to eat adequate amounts of food to meet their nutritional needs. They will enjoy their food more and may try healthy options if they have time to relax, socialize and eat without feeling rushed.⁷ Therefore, the amount of lunch time provided to students is directly linked to their nutritional health and overall well-being.

The Impact of Lunch Time on Academic Performance

According to the Center for Disease Control (CDC), providing adequate time for lunch leads to increased nutritional status, which is directly tied to academic achievement, conduct, and overall school performance.⁷⁻¹⁰ The USDA supports the claims, and also finds that nutritional status is directly related to the physical well-being, growth and development, disease risk, and readiness of a child to learn.¹¹ Undernourishment can have lasting effects on growth, development, and school performance. In fact, undernourished students are 1.44 times more likely to repeat a grade.⁹

Similarly, there is an association between a lack of nutrients and lower math scores.¹² These students also tend to be irritable and have difficulty concentrating, all of which can interfere with learning.¹³ Undernourished children may have difficulty resisting infection and thus are more likely to become sick, miss school, and subsequently fall behind in class.¹⁴ As mentioned above, decreased lunch time is associated with decreased nutrient intake. Therefore, taken

together, inadequate lunch time leads to decreased nutritional status, which negatively impacts academic performance.

The Impact of Lunch Time on Obesity Risk

Shorter lunch times may also be contributing to the rise in obesity rates. In a report by USA Today, 25 million children are considered overweight or obese in the United States.¹⁵ Simultaneously, 31 million students eat lunch in school every day, with more than 11 million eating breakfast at school. That means the majority of US students receive between 30% and 50% of their daily caloric intake from school meals.¹⁶ Consequently, the lunchroom environment plays a key role in the development of eating habits.

According to the USDA, many unhealthy eating habits are established during childhood, which is likely contributing to the current obesity epidemic.¹¹ The amount of time provided for lunch is one key factor influencing healthy eating habits. If students are not given enough time to eat school lunch, they will likely eat too fast, and miss normal body cues telling them that they are full. This is why there is an association between eating rapidly and being overweight in students. Students who engage in rapid eating have three times the risk of being overweight or obese when compared to students who consumed their lunch at a “normal” rate.⁵

One issue with rapid eating is that it can condition children to eat at a faster rate overall, limiting their ability to rely on normal satiety cues, which puts them at a higher risk for being overweight or obese later in life.¹⁷ This is supported by literature showing the positive correlation between eating quickly and body weight.¹⁸ Alternatively, practitioners have successfully coached obese children in reducing meal size and body weight by slowing the speed of eating – a factor which improves key hormonal responses to oral glucose intake.⁵ In theory, providing adequate lunch times will allow students to eat at a comfortable pace.

Additionally, the literature suggests that adequate lunch times may promote healthy habits and conscious eating, reducing the risk of obesity.⁵ The American Academy of Pediatrics suggests if

students are given an adequate amount of time for lunch, they will be more likely to try healthy options.⁷ Providing adequate lunch time could function as an intervention strategy to promote healthy food choices, which may indirectly result in a reduction of childhood obesity and related health concerns.

The Impact of Lunch Time on Food Waste

The amount of time provided for lunch is directly related to food waste and associated costs. Students with a shorter lunch period waste on average 43.5% of their food whereas those with a longer lunch period only wasted 27% of their food.⁶ Research shows that over 70% of fruits and vegetables taken are discarded daily by elementary school children. The overall estimated cost for lunch food wasted nationwide is \$1.2 billion nationally.¹⁹ While some plate waste is unavoidable, excessive waste may be a sign of inefficient operations and delivery systems.²⁰ Factors that have been proposed to influence food waste beyond the NSLP include preferences for fruits and vegetables, length of time to eat, timing of meal, and cafeteria/school environment.²¹

The US Government Accountability Office has proposed that time available for meal consumption is one of the major contributors of increased food waste. In a survey of public school kitchen managers concerning plate waste in the NSLP, 44% reported “not enough time to eat” to be a possible reason for plate waste.²¹ Furthermore, this waste contributes to the decreased nutritional status of our students outlined above. Indeed, substantial food waste among students results in nutrient consumption levels below school meal standards.¹⁹ Therefore waste is another possible outcome for inadequate lunch time. Adequate lunch times could provide improved nutrient intake, reduce waste, and result in cost-savings.

Current Recommendations – National & Local

The Surgeon General (SG) identified schools as a key public health intervention setting to encourage healthy eating behaviors in children. In particular, the SG noted providing an adequate amount of time for students to eat and scheduling lunch periods at reasonable hours around midday should be primary considerations in creating a positive lunch environment for

students.²² According to the National Alliance for Nutrition and Activity, students should be given at least 20 minutes to eat lunch.²³ Moreover, the American Academy of Pediatrics concurs that 20 minutes should be provided, beginning when students sit down until they are instructed to return to their classroom/activity.⁷

The clarification of actual seat-time is an important factor to consider in scheduling, given the time for necessary transition activities during lunch (i.e. wait time in lines and adequate time for waste disposal) and the age of the students.⁶ The National Alliance for Nutrition and Activity (NANA) also recommends administrators schedule lunch between 11am and 1pm. Additionally, no other activities should be scheduled during lunch, and lunch periods should be placed after recess in elementary schools.²³

While some states such as Colorado and Connecticut require schools to provide 20 minutes for lunch, other states only recommend it.²⁴ In 2004, The Seattle Public School Board adopted the “Breakfast and Lunch Program Procedures,” a document reflecting many of the aforementioned recommendations including 20-minute minimum lunch and proper scheduling of lunch times. Evidence of implementation and follow-through of these procedures is not clear. Nevertheless, schools in the western region of the United States were the least likely to provide the recommended time of 20 minutes.²⁵ Subsequently, Seattle School District may not be providing enough time for students to eat lunch.

Determinants of Seat-time – Current Research

“Opportunity time to eat” is defined as the time difference between a students’ receipt of his or her lunch and the end of the lunch period.²⁶ A study sponsored by the National Food Service Management Institute found a small number of cases in which long waiting lines resulted in students having less than 10 minutes to eat.²⁷ Although a new national survey by the School Nutrition Association shows that elementary students have about 25 minutes for lunch, this does not factor in the time spent going to the rest room, washing hands, walking to the cafeteria and standing in line for meals. Often, students are left with only 10-15 minutes to eat their meals, as opposed to the 20 minutes suggested by the government.²⁸

Furthermore, several studies have shown that despite provision of adequate lunch period length, the last students in line are frequently left with only 10 minutes or less to eat lunch. This is consistent with surveys from cafeteria staff and lunch monitors, in which they agreed lunch periods are too short to allow students to buy and eat lunch. In addition, teachers on lunch duty reported that the major barrier preventing them from buying lunch at school was insufficient time to buy and eat their meals. Despite the national recommendations that school lunches not start before 11:00 a.m. some schools schedule lunch periods as early as 9:25am.³ In fact, data from the Department of Education indicates that 40% of the nation's public schools start lunch periods by 10:45 in the morning.²⁹ Such scheduling generates additional problems that may interfere with meal consumption because students might feel less hungry earlier in the school day.⁸ An AUSGAO report in 1996 revealed that food waste is correlated with lack of appetite in children as a result of early lunch periods.³ Not only does lack of appetite during the lunch hour drive students to skip lunch, it may also lead them to snack excessively on unhealthy food items when they return home from school.¹⁸

Bussing time is one of the components associated with meal periods, but data from three studies reveal that bussing trays averaged under one minute across all schools (Conklin).³⁰ However, efficacy of food service such as the number of serving lines, the availability of all food choices in each line, competency of service staff and cashiers, and the ease of use of automated sales systems, have been evaluated as major factors to the reduced time available for students to eat. It has also been shown that the average service time per student varied from approximately three minutes to slightly over eight minutes.³⁰ Although a significant amount of time was used in food delivery, the investigator concluded from the study that eating time is not affected by the efficacy of food service.⁴

Despite a large body of research revealing better student academic performance when recess is scheduled before lunch, most schools schedule recess following lunch.³¹ Providing recess prior to lunch allows students to socialize and burn off energy so that they come to the cafeteria

ready to eat at lunch time.¹¹ Students often prioritize recess over eating when recess is scheduled after lunch. This creates an incentive for students to eat their food as quickly as possible, in order to get out to recess, leading to inadequate consumption of food to fuel them for the day. This can also cause a decrease in consumption of fruits and vegetables, which tend to take longer to chew and eat.^{32, 33} For example, it takes longer to eat a fresh garden salad than mashed potatoes, and it takes longer to eat an apple than applesauce. Indeed, students who had recess before lunch consumed 67% more food and had higher intakes of fruits and vegetables than those who had recess after lunch.^{27, 33}

Altogether, these studies suggest that adequate lunch time is essential for promoting healthy eating among students. Previously, it has been demonstrated that student's eating time is independent of their age, size of school districts, menu, length of meal periods, serving styles, holding of students at the table, or recess schedule.³⁰

To reassess if this trend is consistent among all schools, we conducted cafeteria assessments in seven elementary schools within the Seattle Public School District to study whether students receive enough time to eat lunch. In addition, a plate waste analysis and cafeteria manager survey was conducted in several Seattle schools (four and 68 respectively) to assess the efficiency of school lunch program operations. By identifying these issues and gaining a better understanding of current school lunch operations, food service directors can then collaborate with school administrators to build stronger policies to provide a healthy eating environment for students.

Methods

To assess current lunchroom conditions, a cafeteria analysis was conducted. Teams of three or more visited seven elementary schools in the Seattle Public School District (Appendix 1) and took observational notes on school lunch timing over all lunch periods (Appendix 2). Schools were selected based on the proportion of students participating in the school lunch program—corresponding to a high rate of free-and-reduced lunch recipients. Each observer chose two

students per lunch period to observe and record timing data, as well as data for food eaten, cafeteria supervisors present, number of lunch lines, number of food servers, number of cashiers, and whether or not the observed students seemed rushed.

Once the data was collected, calculations were made for (1) official time for lunch (2) time seated (3) time spent in line (4) time from official start of lunch until the student entered the lunch line (5) time from official start of lunch until the announcement/cue to leave the lunch room was given (6) average seated time in relation to the number of supervisors, and (7) seated time in relation to time to announcement. Averages for each school were calculated, and tables and graphs were created using Microsoft Excel and Stata software.

In order to decipher the amount of food students were wasting, a plate waste study was conducted at four elementary schools in the Seattle Public School District over the course of two weeks. Students were randomly selected in the cafeteria to participate in the survey. A plate waste survey form (Appendix 3) was completed by an observer, and then taped to the bottom of the cafeteria lunch tray. When the observed students were finished with their lunch, they brought the tray to an observation station where plate waste was tallied using visual estimation. Beverage waste was poured into liquid measuring cups for a liquid waste estimation. Results were then entered into Microsoft Excel and Stata software programs for analysis and graphs and charts were prepared.

To determine kitchen managers' perceptions of lunch time in schools, a survey was electronically delivered to 68 SPS elementary kitchen managers (Appendix 4). Several additional emails were sent out to encourage participation. Of surveys distributed, 63 managers responded (92.6%). Prior to looking at survey results, it was arbitrarily determined which survey questions provided relevant information. Data was manually entered into an Excel spreadsheet by coding variables. Comments were qualitatively analyzed by highlighting and tallying categories of responses to each question. Microsoft Excel and Stata software were used to generate charts and graphs.

School principals were also interviewed regarding school lunch timing. Schools were chosen based on location, and proportion of student body that is free-and-reduced lunch. Principals from Emerson, Concord, Dearborn Park, Fairmount, Viewlands, Olympic Hills, Gatzert, West Seattle, Schmitz Park and Muir elementary schools were contacted by email to inform them of an upcoming phone interview regarding the Nutrition Taskforce's charge to review the School Board Adopted Procedure H61.01. This procedure was put in place to provide guidance for principals regarding the amount of time students are provided for meals, the timing of meal periods, and encouraging recess before lunch. On a designated date, 8 principals were contacted by phone and one interviewer asked prepared questions (Appendix 5) while two team members took notes on principal responses. Principals were first asked about the existing 20-minute lunch time structure, how decisions are made regarding lunch time, and if the policy was equitable among all students. They were then asked about a series of proposals to help increase seat-time.

The methods in this study were as objective as possible. Team members were trained on data recording, interviewing techniques and plate waste procedures before the study commenced.

Results

School Observations

The seven schools observed in this study had, on average, 20.71 minutes of official lunch time. This time is meant to include travel time to the lunchroom, time spent in line, and time seated. On average, these 7 schools are out of compliance with both SPS and national standards. Considering all schools individually, three schools may be in compliance, with lunch time spanning 23-27 minutes. However, none of their students had recorded seat-time of 20 minutes. The data shows that, on average, students spend the majority of their lunch break seated, eating their food and socializing (Figure 1).

Students waited an average of 3.54 minutes in the lunch line and were seated for an average of 12.69 minutes. There also appears to be a slight positive trend between the average number of

lunch supervisors present and the average time students spent seated in the lunchroom (Figure 2). Finally, average seat-time compared to the time until an announcement or cue was provided for recess was also observed. “Time until announcement” represents the period from the official start of lunch until the time an announcement or cue is given excusing students. Results reflect a slight positive trend between the time until announcement/cue and the average time seated (Figure 3). Differences in seated time between Figure 1 and Figure 3 are due to missing “time until announcement” data within schools, as many had no bell system associated with lunch. This data is completely missing for Hawthorne.

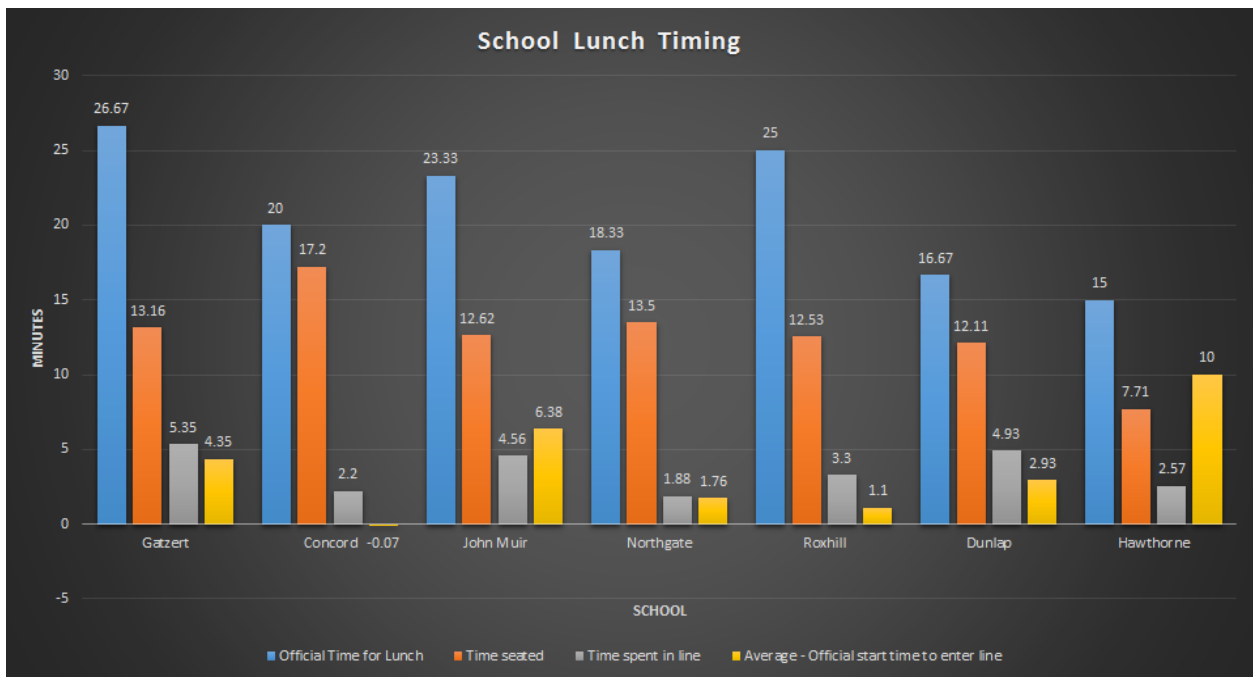


Figure 1: Official time for lunch; time seated; time spent in line; and average official start time to enter line

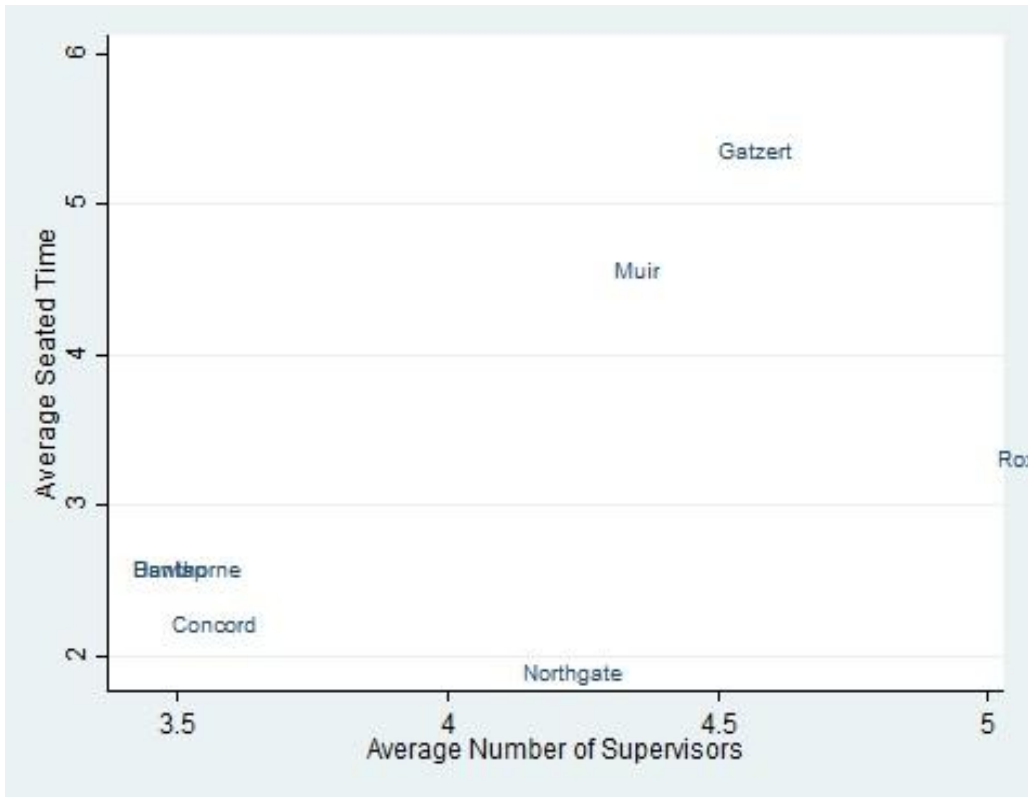


Figure 2: Average Seat-Time vs. Number of Supervisors by School

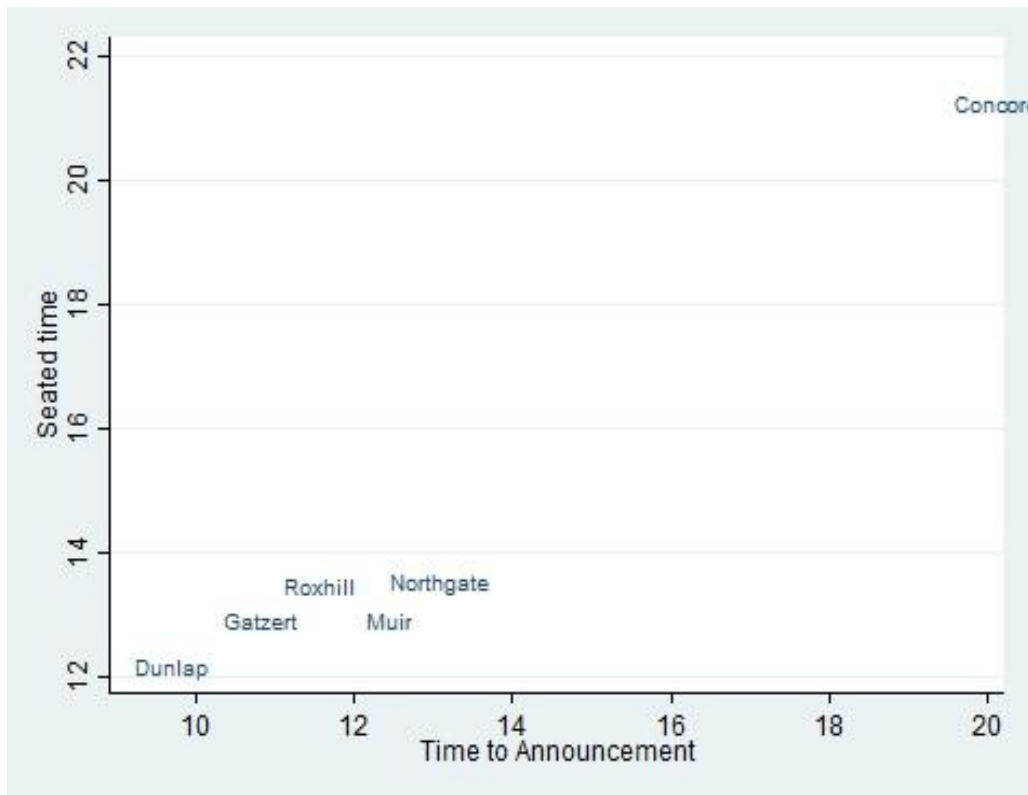


Figure 3: Seated Time vs. Time to Announcement

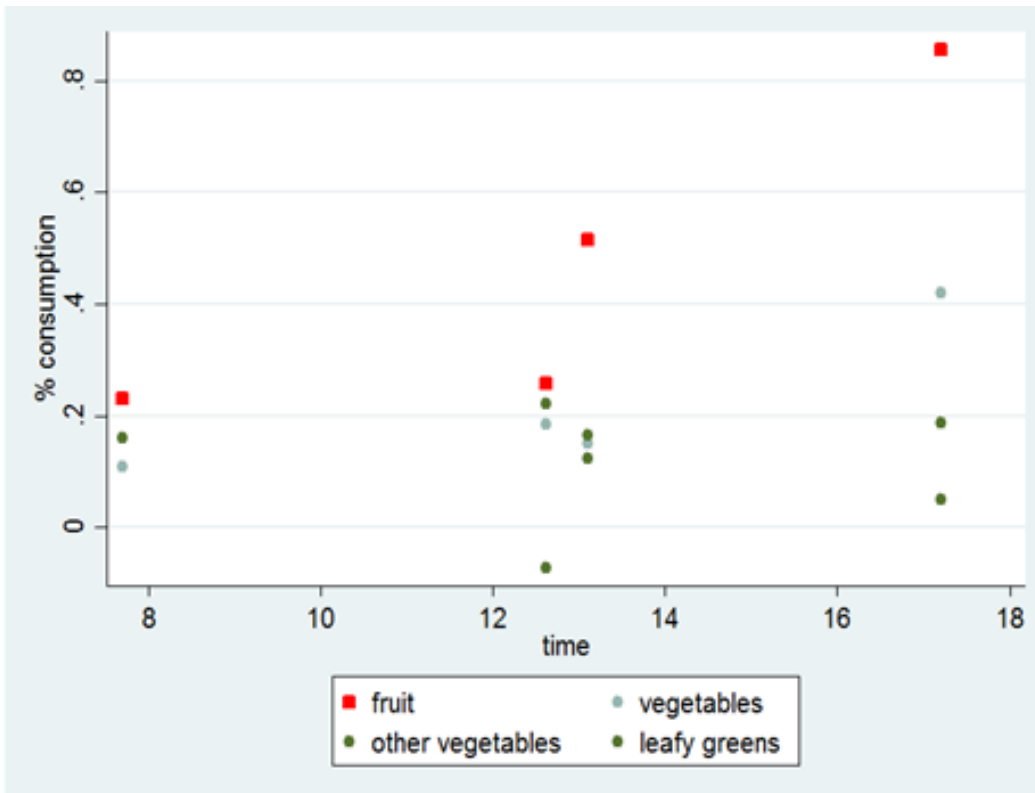


Figure 4: Fruit and Vegetables Consumed by Type vs. Time for Lunch

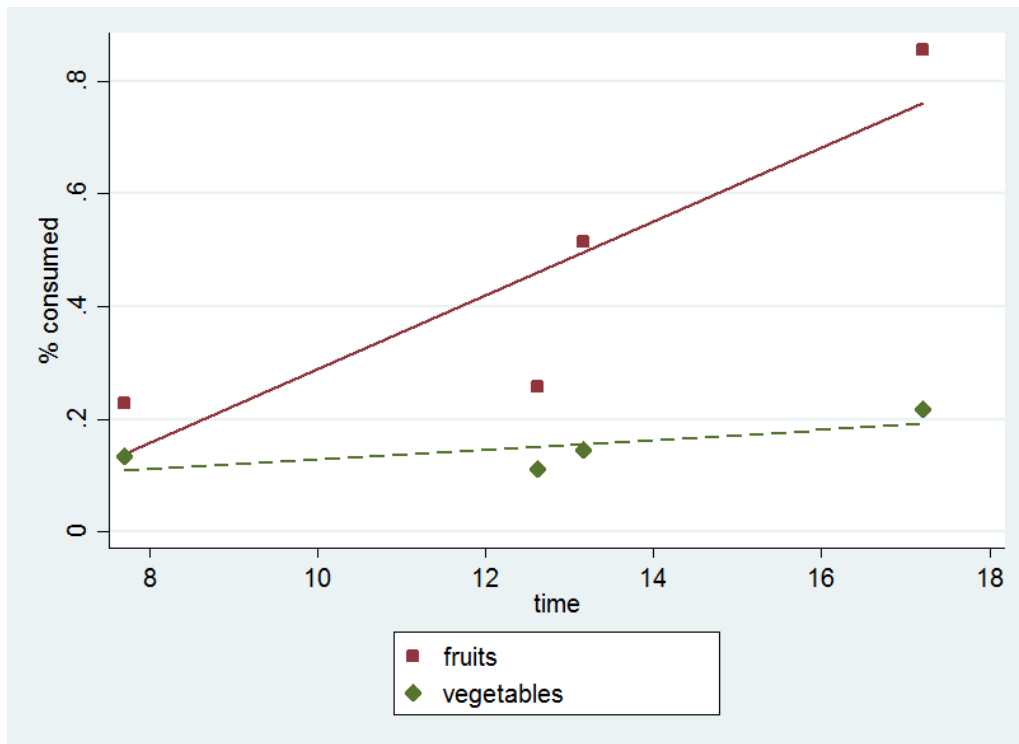


Figure 5: Consumption of Fruits and Vegetables vs. Time for Lunch

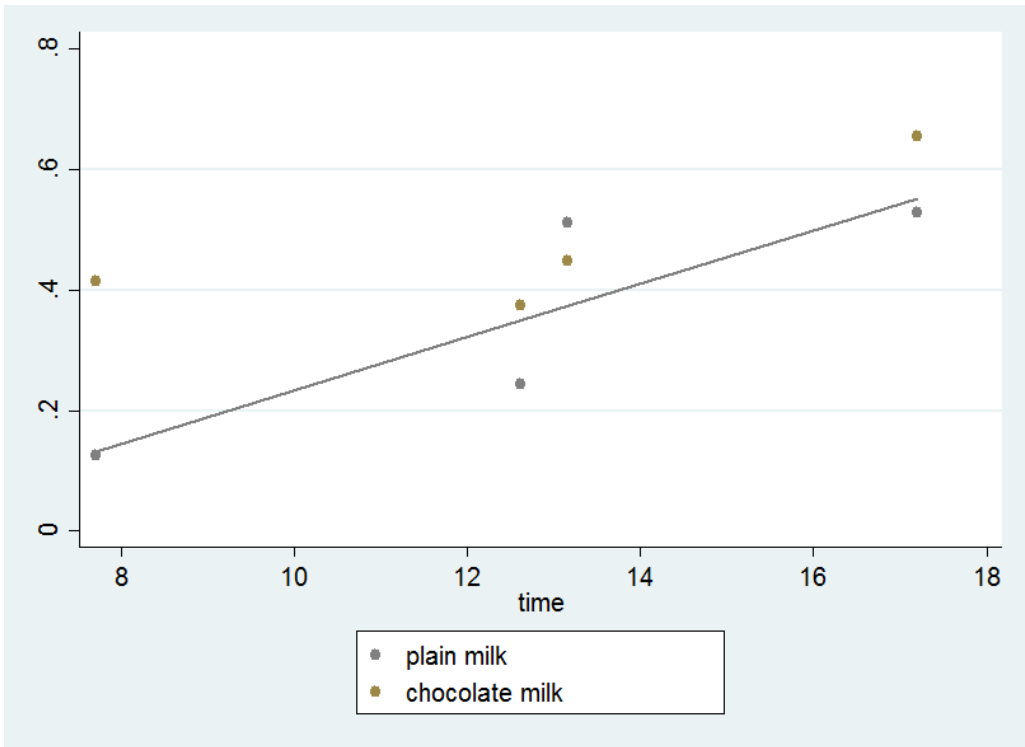


Figure 6: Milk Consumed vs. Time for Lunch

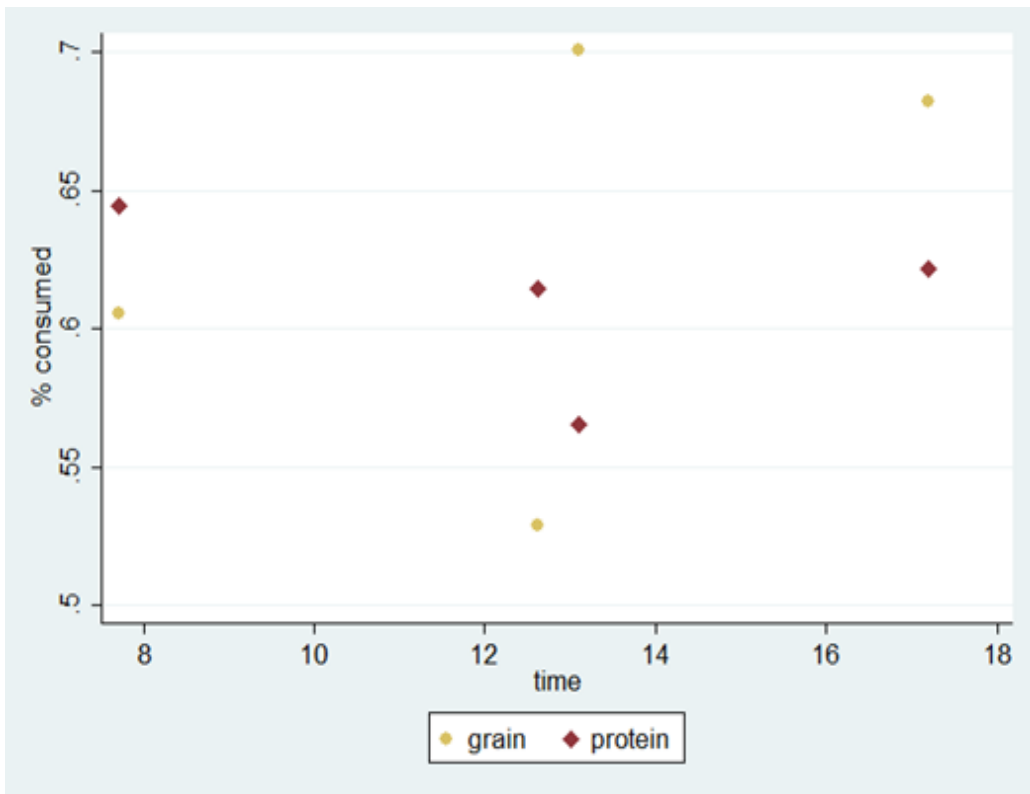


Figure 7: Main Entrée Consumed vs. Time for Lunch

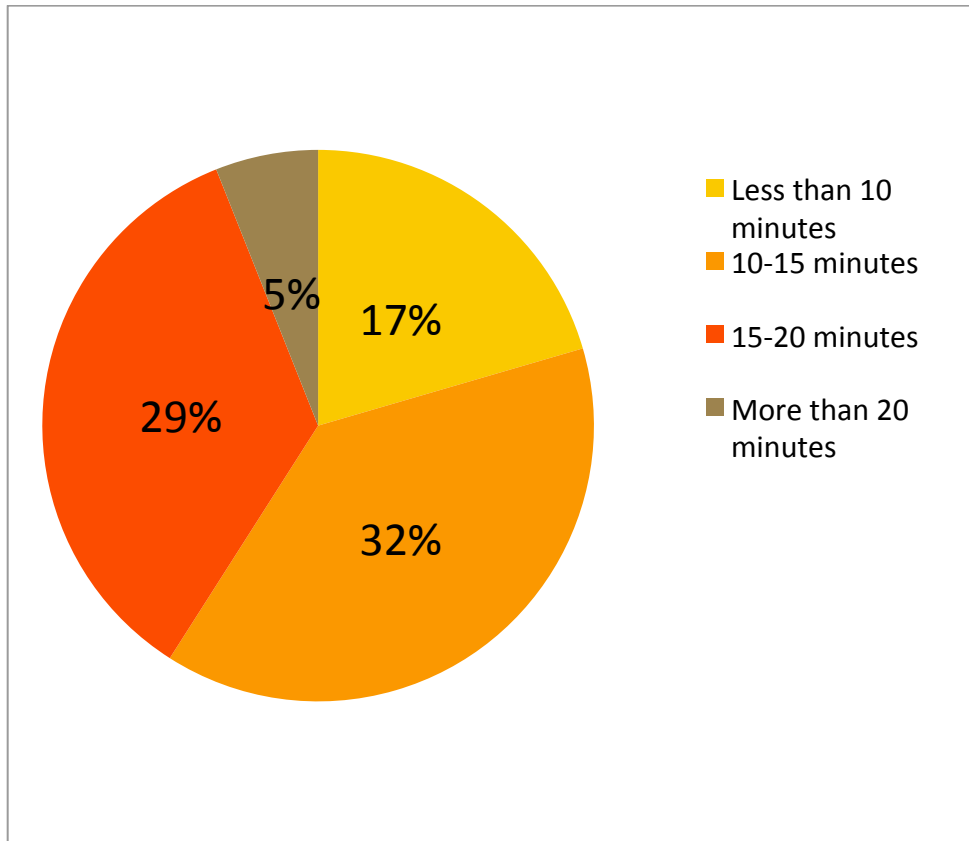


Figure 8: Time Available to Eat According to Kitchen Manager

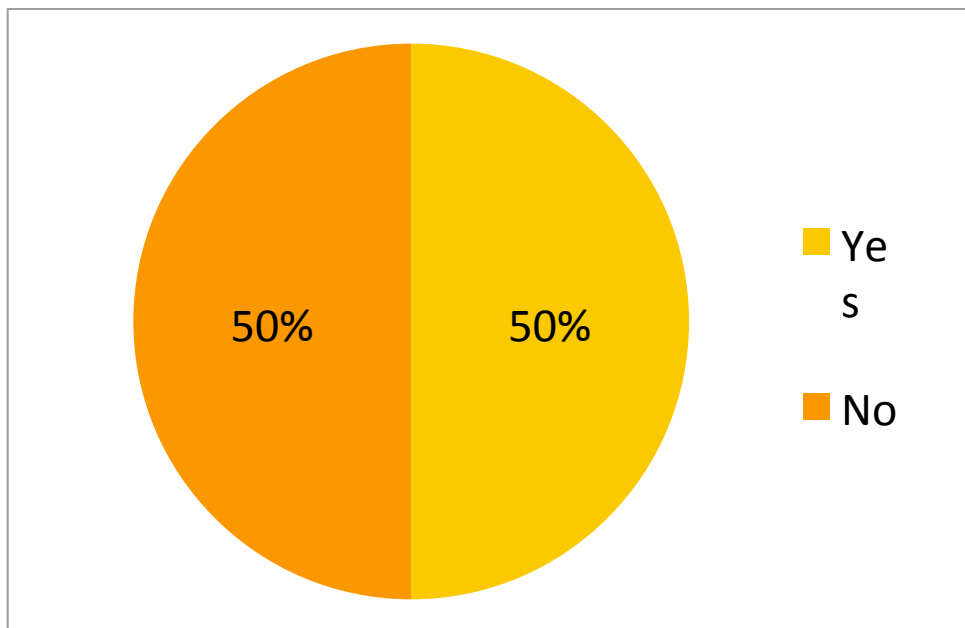


Figure 9: Do Students Have Enough Time to Eat School Lunch According to Kitchen Managers

Results from cafeteria observation revealed what some expected – among all schools, no students achieved 20 minutes of seated time at lunch. Decreased nutritional intake may be one outcome of having insufficient time to eat. Observations revealed fruit consumption increased with seated time. A slight positive trend appears to be present in vegetables. Leafy green consumption did not increase with time (Figure 4), however it is apparent that overall consumption of fruits and vegetables increased with greater time allowed for lunch (Figure 5). Consumption of plain milk increased over time, though overall consumption of chocolate milk was still greater (Figure 6). With regard to main entrees, there was no apparent increase in the amount of food consumed with time (Figure 7).

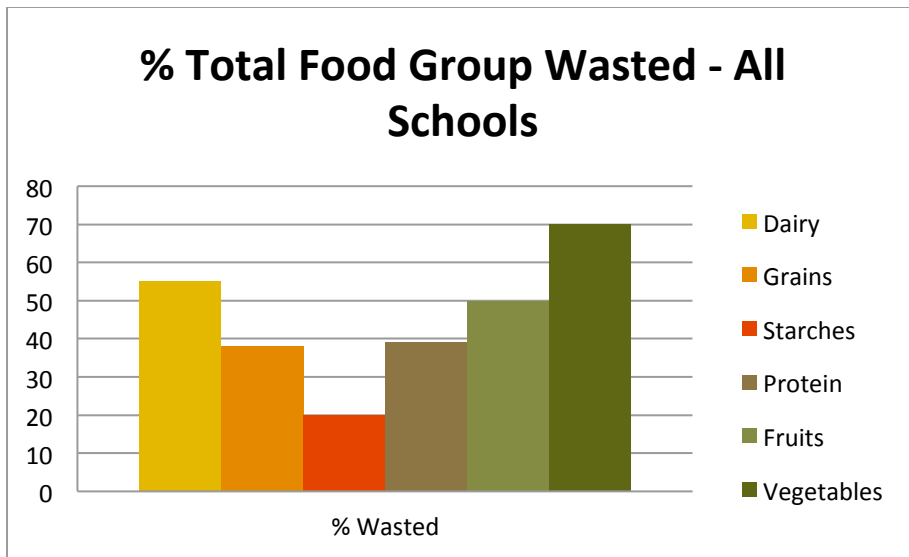


Figure 10: % Total Food Group Wasted – All Schools

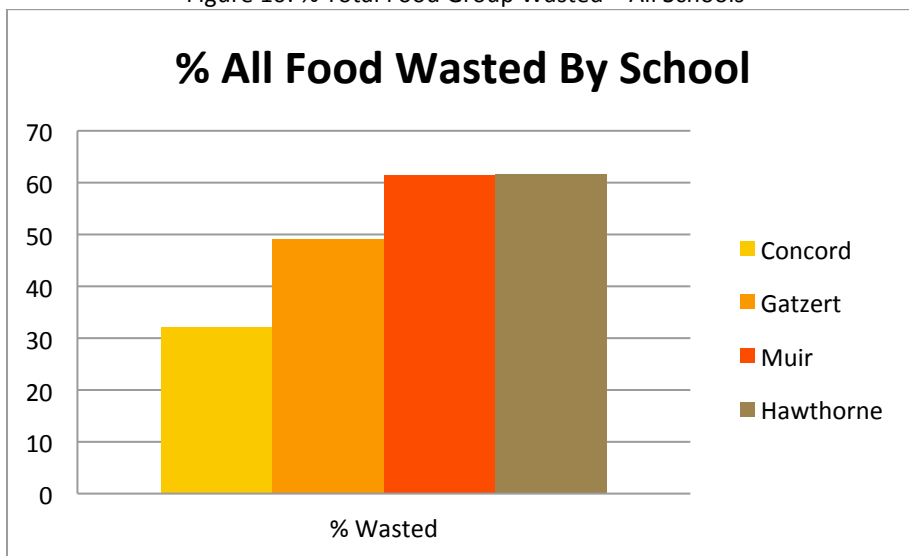


Figure 11: % All Food Wasted by School

Data collected at four different Seattle-area elementary schools from 458 students indicates food waste at lunch is a serious issue. By food group, students wasted vegetables at higher rates than any other category. See Table 1 for both cafeteria menus. In all schools, the vast majority of students placed the recommended amount of food from each food group on their lunch tray, however, on average, students wasted 70% of vegetables, 50% of fruits, 39% of protein, 20% of starches, 38% of grains, and 55% of dairy (Figure 10). This illustrates that while students are aware of what they need to take for lunch, those requirements may not be appropriate. Of the four schools, Concord wasted less food across all categories except leafy greens compared to other schools (Figure 11). Older students tended to waste less food than younger students, and boys wasted less food than girls, though boys wasted more vegetables overall.

Table 1

Menu Option	Dairy	Grain	Starches	Protein	Fruit	Vegetable
#1	Plain or Choc milk	Hot dog bun or sandwich bread	None	Turkey hot dog or cheese in sandwich	Whole apples or pears	Broccoli, baby carrots, kidney beans
#2	Plain or Choc milk	Corn chips or pancakes	Hash browns	Turkey sausages or veggie chili	Oranges slices	Snow peas, red peppers, mixed salad greens

Principals and Staff

Of the eight Seattle principals interviewed, most (six) agreed that a 20-minute lunch period is sufficient. Principals used language such as “good enough,” “you can make it work,” and “neither good nor bad” to describe the amount of time students have to eat lunch. Two of the eight principals interviewed did not believe 20 minutes was adequate. However, principals reported more than 30 minutes of lunch time would cause increased behavioral issues and place stress on the staff. All agreed there are simply not enough minutes in the school day. One

school in particular also uses their cafeteria as the school's gym, and were out of compliance for physical education (PE). By not complying to this state requirement, this particular principal noted that there would be upset parents and stakeholders no matter which factor—adding more lunch time or more PE time—she focused on first.

Realistically, most acknowledged they could not extend lunch time without being out of compliance for instructional time requirements. Adding more minutes to the school day was a desirable option for the majority of the principals, yet not feasible, and was preferred for instructional time rather than lunch time. External barriers exist which block principals from adding time to the school day. Of those listed, at least two or more principals mentioned the following: obtaining a waiver from the state, changing the bus schedule, working with the unions, altering after school programs, as well as teacher contracts. The proposals to add more lunch periods as well as additional lines in the cafeteria seemed to either have already been implemented, or were not possible given that school's particular constraints.

Adding more lunchroom monitors was effective in some schools and not in others depending on budgetary constraints and volunteer involvement. One principal noted regarding her experience at a previous school, "we wouldn't need anyone other than me in the lunch room each day. Here, we need at least five lunchroom monitors. I don't understand the difference, but there you go." Overall, the principals seemed to understand that there is inherent value in having enough time for students to eat their lunches.

Kitchen manager surveys were electronically delivered to all Seattle Public School elementary kitchen managers. Of 68 surveys distributed, 63 managers responded. The average length of lunch periods reported by managers was 21 minutes. Six managers reported that their first lunch period was shorter than the officially posted lunch times. However, many managers reported that once students are seated, the students had less than 20 minutes to eat. Despite an average reported lunch time of 21 minutes, 17% of managers reported their students had less than 10 minutes to consume their lunches after getting through the lunch line (Figure 8).

Generally, schools with a higher proportion of students participating in school lunch were reported to have less time to eat their lunches once seated (Figure 2). This could be due to time allotted for lunch periods or crowding in lines. Similarly, students in schools with higher eligibility for free and reduced price lunch were reported to have less time to eat (Figure 3). This could also be a function of the number of students in line, or it could be that schools with higher eligibility budget less time for students to eat. Although many students had less than 20 minutes to eat, half of managers reported students had enough time to eat. The other half of kitchen managers believed students did not have enough time to eat (Figure 9). Additionally, more managers expressed positive feelings about recess before lunch as compared to negative feelings. Managers were also asked what changes they thought would help give students the necessary time to eat at school. Suggestions emphasized increasing time to eat, rather than adding staff, adding an additional lunch period, or reducing delays.

Findings

Non-Compliance of Official School Lunch Times

Analysis of official school lunch time in seven schools showed that only three schools provided more than 20 minutes of total time to eat lunch. However, cafeteria observations suggested that none of the schools complied with National standards and SPS policy for providing adequate time to eat - none of the students had recorded seating times of 20 minutes or more. This is consistent with previous data provided by the *Bridging the Gap research program* indicating schools in the Western part of the United States do not provide the minimum recommended time for lunch.²⁵ The School Health Policies and Programs Study showed that one-fifth of U.S. schools give students less than 20 minutes to eat lunch.³⁴ It is apparent from our study that Seattle schools are not meeting the national standards of providing students at least 20 minutes to each lunch.

Shortened Seat-Time

Findings from the National Food Service Management Institute (NFSMI) show that students have less than ten minutes to eat, but this was not the case in this study.⁴ Students spent an average of 13 minutes eating lunch despite being given an average of 20 minutes of total lunch

time. This data may explain why some principals (25%) and kitchen managers (50%) suggested that 20 minutes is adequate for students to eat lunch. Similar to Bergman et al's findings, in this study students spent an average of approximately 3.5 minutes in line.¹⁷ Furthermore, on average students took 4 minutes to reach the cafeteria. Together, these data points contribute to one-third of the time students have to eat lunch. Given the shortened amount of time to eat lunch, students may be guided towards eating their lunch faster, thereby contributing to adverse health outcomes.

Possible Benefits & Barriers to a Lunch Period Extension

This study reveals that efforts to extend school lunch time are needed in order to comply with SPS and national school lunch time standards. In fact, most kitchen managers are in favor of increasing lunch length. Although rescheduling school schedule to accommodate longer lunch periods has been proposed as an option to increase lunch length, several principals found this approach impractical, especially since the total length of the school day was not associated with lunch duration.^{4, 24}

Principals indicated that extending the lunch period would be an infeasible approach as schools are often restricted by budgets and challenged by other factors such as time required for instruction, teacher contracts, after-school programs, bus schedule and union constraints with regards to extending lunch times. In addition to these barriers, some principals also believe that extension of lunch length may cause behavioral issues in children. This is consistent with observations made by Henderson et al. The authors suggested that providing students with constructive activities at the end of lunch could allow for longer lunch periods without increasing behavioral problems.⁴

Time Constraints and the Effect on Nutrient Consumption

The "Lunchtime at School" study showed students with longer seat-time consumed more fruits (50%) and vegetables (17%). Additionally, students at Concord had the longest seat-time (18 minutes) and consumed approximately half of their food, while students at Hawthorne had the shortest seat-time (8 minutes) and consumed less than a quarter of their food. This is

consistent with Buerger et al's findings wherein students with longer lunch periods consumed more food and nutrients.¹⁷ Undernourishment can affect students' growth, development and school performance.¹¹ Therefore, giving students enough time to eat ensures they consume adequate food and nutrients.⁷ Previous research demonstrates that time is an important factor when it comes to food choices among students. Students with limited time to eat tend to consume what they like most, rather than nutritious foods such as fruits and vegetables.³ This is supported by Krølner et al, who found pre-packaged foods such as chips are the most attractive food items among children.³³ Furthermore, when given time constraints, students often choose foods that are easier to consume, which are often less healthy options.⁹ Altogether, these findings highlight the importance of seated time and food/nutrient consumption in students.

Implications of Recess Timing

The NANA recommends providing recess before lunch,³⁵ however at least 44% of Seattle Public Schools are not meeting this recommendation. Bergman et al found that schools with recess before lunch ate 67% more of their food,³⁶ and the "Lunchtime at School" study showed a positive trend between a later announcement/cue for recess and seated time. Furthermore, as reasoned by the NFSMI, students who have lunch before recess tend to anticipate recess and do not focus on eating.³⁷ This limits the opportunity for maximum lunch consumption.

A recent study showed that recess before lunch is associated with a decrease in discipline problems on the playground, in the cafeteria, and in the classroom. The investigator further emphasized that students returned to class more settled, calmer and ready to learn. Besides these observations, students also reported preferences for having recess prior to eating lunch.³⁸ Given the result of the current research, it appears that placement of recess in relation to the lunch period may be an important factor in determining student seat-time. Analysis of manager surveys further emphasized that scheduling recess before lunch is likely to encourage longer seat-time for students because they tend to be more interested in recess and socializing rather than eating their lunch if recess is scheduled after lunch periods. While some principals support scheduling recess prior to lunch as an effective means to encourage lunch consumption in students, they are challenged by external factors such as the school space and supervisor

requirements when it comes to recess. Therefore an effective strategy to encourage a healthier school environment may be to change policies around recess scheduling with respect to lunch time.

The Impact of Supervision on Eating Behaviors

The positive trend between the time until announcement/cue and the average time seated found here (Figure 3) supports previous research indicating that lunchroom supervisors may influence the success of the school lunch programs and impact student eating behaviors at lunch time.³⁹⁻⁴¹ The cafeteria observers noted that Concord supervisors also positively engaged with students. Simultaneously, Concord was characterized by the longest seated time, highest consumption of fruit and vegetables and lowest plate waste. Even if principals lack the money to add supervisors, there may be an opportunity to provide further training that encourages better eating habits in students.

Lunch Scheduling and Food Consumption

Earlier lunch periods were linked to the highest plate waste. With the exception of the students observed at Hawthorne Elementary, younger students were the first to eat. These data are consistent with published literature revealing that early lunch periods lead to a lack of appetite which is correlated with increased food waste.^{3, 18} Alternatively, younger students may require longer lunch periods than older students due to undeveloped sense of time or ability to manipulate food, such as open milk cartons or bite whole apples.^{42, 43} However, even if most of the principals and kitchen managers acknowledged the possibility to extend lunch periods, principals contend that they could not extend lunches without being out of compliance for instructional time requirements.

Recommendations

This study reveals both the importance of adequate time for lunch and the fact that Seattle public elementary schools are out of compliance with lunchtime policy. The following is a list of recommendations to improve school compliance with lunchtime policy based on the results of this study:

-
- **Elevate the status of lunchtime.**
-

- **Increase the dialogue and collaboration between school administrators and Nutrition Services staff.**
- **Educate stakeholders (principals, teachers, Nutrition Services staff, etc.) on the importance of school lunch.**
- **Encourage a diverse coalition of stakeholders to advocate for lunchtime scheduling.**

Administrators and schools facing scheduling constraints may adopt the following recommendations to maximize lunch periods:

- **Schedule recess prior to lunch.**
- **Utilize more discrete recess cues.**
- **Train lunchroom supervisors to encourage positive eating behaviors in students.**
- **Emphasize the importance of giving students adequate time to get to the cafeteria.**

Together these recommendations lay the groundwork to provide administrators with a variety of options that may maximize the time students have available to eat lunch.

Conclusion

Though this study provides a broad overview of some of the limitations of the current lunch time structure in Seattle Public Schools, additional work will be needed to address these challenges. In particular, it is apparent that many schools have a unique structure—whether in cafeteria size and layout, instructional needs, disciplinary differences, size of enrollment, etc.—and will require depth of study not feasible for this investigation. Regardless, the literature reviewed does indicate that changes to the time allowed for school lunch will have positive impacts for students across instructional- and health-related outcomes. As average values for lunch time were found to be below acceptable ranges, two recommendations were identified from previous research sources: (1) to comply with the 20-minute seat-time standard recommended by expert organizations and (2) to maximize the time that students have to eat within existing schedules.

Contrary to previous studies that merely focused on the quality of food students consume, the present report took into account individual school's lunch hour policies and food service structure. Limitations of the assessment included the lack of representativeness of school lunch habits or district patterns, as well as small sample sizes in snapshots of single-day samples.

Future research should cover additional days, be less cross-sectional in scope, and cover potential differences between schools' size, percentage receiving school lunch, and other factors that may directly impact the school lunch environment.

Overall, the evaluation of the potential drivers and outcomes related to adequate seat-time for students will be useful for health professionals, school administrators, and foodservice directors to collaboratively improve the health of students. The ability of Seattle Public School District to adapt to these and other findings will ultimately contribute to more positive lunch time environments for Seattle students. Given the overwhelming evidence for placing greater value on lunch time within the school schedule, this could have a positive impact on a number of outcomes not solely limited to student nutrition status. Taking a broader view of the potential impact may be a valuable tool for recruiting a diverse set of stakeholders to meet these challenges.

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Appendix 1 – Cafeteria Assessment & Plate Waste Schools

NUTR 531 Study Schools with teams

Winter 2015

Plate Waste	Cafeteria Assessment	Elem. Schools	October 2014 Enrollment	%Eligible Free/ Reduced	Average Daily Lunch Participation		Lunch	Minutes	Lunch	Minutes	Lunch	Minutes
	1/20	Northgate	246	79.60%	168		11:25-11:40	15	11:50-12:05	15	12:15-12:40	25
	1/20	Roxhill	430	78.89%	260		12:00-12:25	25	12:30-12:55	25	1:00-1:25*	25
	1/27	Dunlap	455	70.33%	339		11:00-11:20	20	11:25-11:40	15	11:55-12:10	15
1/20	1/27	Hawthorne	365	70.10%	243		11:10-11:25	15	11:30-11:45	15	11:50-12:05	15
1/20	2/3	Muir	441	65.99%	264		11:25-11:50	25	11:55-12:20	25	12:20-12:40	20
1/27	2/3	Concord	452	81.64%	316		11:35-11:55	20	11:55-12:15	20	12:30-12:50	20
1/27	2/3	Gatzert	357	79.55%	302		11:20-11:50	30	11:55-12:20	25	12:25-12:50	25

*Roxhill last lunch period may end too late-will check schedules

Appendix 2 – Elementary School Cafeteria Observation Form

School _____ Observer Name: _____

Date: _____ Lunch Period: #1 #2 #3

Specified Lunch Period: From _____ To _____

Student #1			Student #2		
		Time ↓ 00:00 hr/min			Time ↓ 00:00 hr/min
A	Lunch start time (bell rings)		A	Lunch start time (bell rings)	
B	Enters lunch line		B	Enters lunch line	
C	Arrives at Cash Register		C	Arrives at Cash Register	
D	Leaves Cash Register With Lunch		D	Leaves Cash Register With Lunch	
E	Sits Down to Eat		E	Sits Down to Eat	
F	Announcement made to begin cleaning up table		F	Announcement made to begin cleaning up table	
G	Leaves Table		G	Leaves Table	
H	Bell rings-end of lunch		H	Bell rings-end of lunch	

Summary Data

	Student #1	Student #2
Time between start of lunch and entering lunch line: (B-A)	min	min
Total time in lunch line (D-B)	min	min
Time at cashier (D-C)	min	min
Seated Time (G-E)	min	min
Time between sitting down and announcement made to clean up (F-E)	min	min
Time between sitting down to eat and bell ring/end of lunch (H-E)	min	min
Approximate amount of main entree consumed	¼ ½ ¾ all	¼ ½ ¾ all
Approximate amount of fruit and/or vegetables consumed	¼ ½ ¾ all	¼ ½ ¾ all
Appeared rushed to finish lunch yes/no (circle one)	yes/no	yes/no

Total # of lunch lines _____

Total # of cashiers _____

Total # of food servers _____

Total # of adults supervising lunchroom _____

Other observations: (delays in lunch due to announcements, disciplinary actions, other?) _____

Appendix 3 – Plate Waste Survey Form & Protocol

Lunch Period ID:	
Plate ID:	
<input type="checkbox"/> Male <input type="checkbox"/> Female	

SAMPLE FORM

I. SELECTED			II. REMAINING							
Category	Item	#	0	1-25%	26-50%	51-75%	76-99%	100%	?	Notes
<input type="checkbox"/> Milk	<input type="checkbox"/> White milk									
	<input type="checkbox"/> Chocolate milk									
<input type="checkbox"/> Juice	<input type="checkbox"/> Orange juice									
	<input type="checkbox"/> Apple juice									
<input type="checkbox"/> Fruit	<input type="checkbox"/> Apple (whole)									
	<input type="checkbox"/> Orange (whole)									
	<input type="checkbox"/> Banana (whole)									
	<input type="checkbox"/> Fruit cup (cup)									
	<input type="checkbox"/> Grapes (bag)									
	<input type="checkbox"/>									
	<input type="checkbox"/>									
<input type="checkbox"/> Vegetable	<input type="checkbox"/> Green salad (box)									
	<input type="checkbox"/> Carrots (bag)									
	<input type="checkbox"/> Lettuce, tomato, pickle (cup)									
	<input type="checkbox"/> Bean salad (cup)									
	<input type="checkbox"/> Potatoes, side (paper boat)									
	<input type="checkbox"/> Potato salad									
	<input type="checkbox"/>									
	<input type="checkbox"/>									
<input type="checkbox"/> Entrée	<input type="checkbox"/> Cheese pizza									
	<input type="checkbox"/> Pepperoni pizza									
	<input type="checkbox"/> Sub sandwich: <input type="checkbox"/> Lett <input type="checkbox"/> Tom <input type="checkbox"/> Pickle									
	<input type="checkbox"/> Onion									
	<input type="checkbox"/> _____w/potatoes									
	<input type="checkbox"/> Chicken Caesar salad (box)									
	<input type="checkbox"/>									
	<input type="checkbox"/>									
<input type="checkbox"/> Other	<input type="checkbox"/> Pudding (cup)									

<input type="checkbox"/>	Cookies (bag)								
<input type="checkbox"/>	Potato salad (cup)								
<input type="checkbox"/>	Dinner roll								
<input type="checkbox"/>									

PLATE WASTE PROTOCOL – NUTR 531 Winter 2015

Set-up/advance work:

- Put signs on all trash and recycle bins reminding students who have received a “tray card” to deposit their food in the “tray rack” rather than the trash bins that day.
- Set-up an observation station with rack nearby. Use large signs to direct students to the “tray rack.” (Observation station will need: a table, 1-2 racks, pens, milk measuring cup and waste bin, and large garbage/recycling bins.)
- Randomly select sample of tables/sections based on coded map of cafeteria table layout and number of staff available. (Tables/sections that seat an estimated 10-12 students are identified by letter or # code; researcher randomly selects one coded section for each volunteer.)
- Provide all research team members with necessary equipment (e.g., clipboards, forms, pens).

Enrolling and interacting with students:

- Position one research team member near each of the sampled tables/sections.
- Invite the selected students to participate in the study using the script
- **Introductory Script:** *Hi, my name is _____. I am here today with a team that is trying to learn more about the foods that students eat for lunch. Can I tape this card to your tray? When you are finished, bring your tray with any food you haven't eaten and all of the trash on it to the rack (point to rack). You don't have to participate if you don't want to. If you are willing just raise your hand or tell me and I'll give you a card. Does anybody have any questions?*
- Complete one **colored card** for each student who agrees to participate, identifying the students' selected food items. Fold the sheet in half and tape it to the “tray” (boat or plate) if possible.
- Instruct the students to keep the card with their food and to deposit their trash in the “tray rack” rather than the trash bins when they are done eating.

Research team roles:

- (~2) at observation station: Direct and help students put trays in the “tray rack,” conduct measurements of the food, take photos of the trays, and deposit the waste into trash bins
- (~2-5) at tables: Describe the study, complete the “tray cards,” instruct students to take trash to the “tray rack”

Coding Guidance:

Field	Instructions
Lunch Period ID	Insert as provided (based on date, school, lunch period)
Plate ID	[Observer's letter code] – [Consecutive 3 digit number] (e.g., EQ-001, EQ-002, EQ-003)
Sex	Check "male" or "female" based on observation
Category	Tick each box for which student has selected at least one item
Item	Tick each box for which student has selected or more of the items
Quantity	Note the number of item units. Units refer to pieces of whole fruit; containers of milk or juice; packages of fruit or vegetables; pieces of pizza; sandwiches; or servings of an entrée.
% Remaining	<p>Tick one of the six boxes based on the amount of each item you observe remaining as follows:</p> <ul style="list-style-type: none"> • 0: The item has obviously been completely consumed (e.g., empty packaging remains) or is no longer on the tray • 1-25%: Refers to edible portion of item (e.g., not the apple core or banana skin); 2 oz. or less of milk • 26-50%: Refers to edible portion of item (e.g., not the apple core or banana skin); between 2.1 oz. and 4 oz. of milk • 51-75%: Refers to edible portion of item (e.g., not the apple core or banana skin); between 4.1 oz. and 6 oz. of milk • 76-99%: Refers to edible portion of item (e.g., not the apple core or banana skin); between 6.1 oz. and 7.9 oz. of milk • 100%: The item has obviously been untouched (e.g., unopened). • ?: It is too hard to tell how much is remaining of the food for some reason (e.g., item has been mashed up, milk has spilled)
Notes	Describe any anomalies (e.g., food for which there should be some remains but isn't, food not initially checked off is on the plate)
Additional Coding Instructions	<ul style="list-style-type: none"> • Do not record any items for which there is no row (e.g., competitive snack foods/drinks, foods from home). • If the observer sees evidence of an item which wasn't marked on the card: check the category, note the quantity, complete the right side of the card, and write "ADDITION" in the notes field. • If the observer sees no evidence for an item for which there should be: mark the "0" box and write "MISSING?" in the notes field. • If food has been obviously mashed together or handled in some way that makes the observation impossible, mark "INDECIPH" in the notes field. • If the tray is missing a card, use a blank card and make a best attempt to identify and quantify the items and waste based on what is left on the tray. Write "MISSING CARD" at the top of the card.

Appendix 4 – Kitchen Manager Survey

Seattle Public Schools Elementary School Kitchen Manager Survey

We are working with the University of Washington to study the lunchrooms in our elementary schools. This survey will help us provide them with valuable information about your school. All results will be combined so that your school will not be identifiable in the results. The survey should take only about 15 minutes for you to complete.

Please complete the survey NO LATER than December 15.

Thank you!

1.) School Name _____

2.) Approximate Seating Capacity of Cafeteria _____

3) How many lunch lines do you have in your cafeteria? _____

How many cashiers do you have in your cafeteria? _____

How many key pads do you have in your cafeteria? _____

4a.) First Lunch Start Time (do not include recess time) _____

First Lunch End Time (do not include recess time) _____

Average Number of Lunches Served First Lunch _____

4b.) Second Lunch Start Time (do not include recess time) _____

Second Lunch End Time (do not include recess time) _____

Average Number of Lunches Served Second Lunch _____

4c.) Third Lunch Start Time (do not include recess time) _____

Third Lunch End Time (do not include recess time) _____

Average Number of Lunches Served Third Lunch _____

5.) Does your school have recess before lunch? Yes No

Comments about recess before lunch:

6.) If you do not have recess before lunch, do you know if it is being discussed or considered at your school?

- Yes it is being considered
- No it isn't being considered
- I'm not sure

Additional comments:

7.) About how much time do you think students who get school lunch have to eat their lunch? (This means, from the time they sit down with their lunch to the time they are dismissed.)

- Less than 10 minutes
- 10 to 15 minutes
- 15 to 20 minutes
- More than 20 minutes

8.) In general, do you think this is enough time for students to eat school lunch at your school?

- Yes
- No

Comments:

9.) What changes do you think would help to give students the necessary time to eat at your school? (check all that apply)

- no changes are needed at my school
- increase the lunch time by 5 minutes
- increase the lunch time by 10 minutes
- increase the lunch time by more than 10 minutes
- add another lunch period (we have too many students to serve efficiently)
- add another lunch line and/or cashier
- reduce the delays before students can get their lunch (for example announcements, disciplinary activities, etc)
- other ideas?:

Ideas:

10.) As far as you know, how are decisions about the number of school lunch periods and time for lunch made at your school?

11.) In general, how happy are you with the number of students at your school who eat school lunch?

- Very happy, I think we reach the right number of students
- Somewhat happy, we could be serving more students school lunch
- Not happy, I know that more students here could benefit from school lunch

12.) Do you have any final comments to make? Anything else you would like for us to know about your school lunch program?

Final comments and thoughts:

Appendix 5 – Principal Survey

NUTR 531-School Lunch Times Project Principal Interviews Interview Template

Principal Name:

School:

Date:

Interviewer:

My name is _____. I am a graduate student from the University of Washington, School of Public Health. We are working on a project that will help to support school district administrators in identifying and addressing any concerns they have about the amount of time that students have to eat school lunch. Thank you for agreeing to speak with us today about this topic. Is this still a good time? *(If yes, proceed. If no, reschedule).*

1. How are decisions made regarding lunch times and the number of lunch periods at a school?
2. The district policy calls for “meal periods to allow 20 minutes for students to eat lunch with additional time as appropriate for standing.” In some schools, this happens, in some it does not. What do you think are the reasons for that?
3. How do you feel about this policy? Is it realistic? Is it a good policy?
4. Do you think that some students have more time to eat during lunchtime than others? If yes, please explain. Probe: what about students who bring their lunch vs those who eat school lunch?
5. For schools that have difficulty providing 20 minutes of seat time for students to eat lunch, several solutions have been proposed. I would like to ask you about each of these proposed solutions.

5a) <u>Adding time to the school day:</u>
<ul style="list-style-type: none"> • Would this be effective?
<ul style="list-style-type: none"> • Can you think of any unintended consequences?
<ul style="list-style-type: none"> • Do you think that it would result in a fair outcome for all students? What about teachers and other school staff?
<ul style="list-style-type: none"> • Would there be costs associated?
<ul style="list-style-type: none"> • How feasible or realistic is it to take this step?
<ul style="list-style-type: none"> • Who would it likely be most acceptable to? Who might not find it acceptable?
5b) <u>Adding another lunch period</u>
<ul style="list-style-type: none"> • Would this be effective?
<ul style="list-style-type: none"> • Can you think of any unintended consequences?
<ul style="list-style-type: none"> • Do you think that it would result in a fair outcome for all students? What about teachers and other school staff?
<ul style="list-style-type: none"> • Would there be costs associated?
<ul style="list-style-type: none"> • How feasible or realistic is it to take this step?
<ul style="list-style-type: none"> • Who would it likely be most acceptable to? Who might not find it acceptable?
5c) <u>Increasing the number of lunch lines or other cafeteria reconfigurations</u>
<ul style="list-style-type: none"> • Would this be effective?
<ul style="list-style-type: none"> • Can you think of any unintended consequences?

<ul style="list-style-type: none"> Do you think that it would result in a fair outcome for all students? What about teachers and other school staff?
<ul style="list-style-type: none"> Would there be costs associated?
<ul style="list-style-type: none"> How feasible or realistic is it to take this step?
<ul style="list-style-type: none"> Who would it likely be most acceptable to? Who might not find it acceptable?
5d) Adding more lunchroom monitors to help younger students
<ul style="list-style-type: none"> Would this be effective?
<ul style="list-style-type: none"> Can you think of any unintended consequences?
<ul style="list-style-type: none"> Do you think that it would result in a fair outcome for all students? What about teachers and other school staff?
<ul style="list-style-type: none"> Would there be costs associated?
<ul style="list-style-type: none"> How feasible or realistic is it to take this step?
<ul style="list-style-type: none"> Who would it likely be most acceptable to? Who might not find it acceptable?
6. Do you have ideas for other solutions or ways to address the problem?
7. Do you have any other thoughts to share with us about the amount of time that students have to eat lunch in your school or the district as a whole.
Thank you so much for taking the time to talk with us. We will be preparing a full report and

briefing paper that will synthesize what we are learning from principals, along with other assessments we have conducted in elementary schools in the district. We will be inviting district stakeholders to the presentation in March, and will provide the district with a copy of the report for distribution to principals and other key administrators.