

HIGH SCHOOL STUDENTS' PARTICIPATION AND SATISFACTION OF THE
SCHOOL LUNCH PROGRAM

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ABSTRACT

Purpose: The National School Lunch Program (NSLP), funded by the United States Department of Agriculture (USDA) is an important program that provides healthy and balanced meals to school age children, many at free or reduced costs, for students that are eligible. The School Foodservice Authority that administers the NSLP strives for high customer (student) satisfaction and participation, healthy and palatable meals that fit within the meal pattern regulations, and financials that break even with reimbursement revenue to expenses. Older students participate in school lunch less frequently than younger students and often have access to more lunch options, as open campus lunch periods. Understanding and proactively addressing students' participation and satisfaction of the school lunch program is essential to having high meal participation to generate revenue and high customer satisfaction. To understand the perception and satisfaction of high school students in regards to the school lunch program in a public school district in Wisconsin, a survey was conducted using a modified questionnaire.

Subjects: The subjects of this study were high school students (n=5,487) enrolled in four high schools and in attendance during the first full week of October 2016. These students at the selected schools follow the same menu offerings and have access to a sub sandwich station, taco station, salad bar, and two homemade, pizza, or sandwich options daily for school lunch entrees.

Methods: Parents were notified of the study via school newsletter and the district's Food Service website. The survey used two validated questionnaires and modified the statements to those of interest and controllable by foodservice. The questionnaire contained general questions about the student and their frequency of eating school meals, then specific questions on rating the school lunch (for participants) or selecting improvements that would influence the nonparticipating student to eat school lunch, and lastly topics and ideas for new menu items. Students were sent a link to the questionnaire via their student email account. The survey period lasted one week. During that week, staff and administration promoted the surveys by social media updates, email reminders, and morning announcements. Data were summarized using descriptive statistics of percentages and means. Comparisons between participants eating daily and participants eating sometimes were analyzed using independent t -tests.

Results: Of the schools participating in the study, the percentage of students with free, reduced and paid eligibilities ranged from 34% to 64% of students receiving free meals, and 39% to 60% having to pay full price for school meals. The overall average daily participation of students eating school lunch was 42%. Over the week of survey administration, 1,309 students accessed the survey link and 1,292 agreed to take the survey. Of those, 1,184 students responded to the frequency of eating school meals. Students in this study were evenly distributed according to frequency of eating school meals. About one-third (31%) of students reported eating school lunch daily, 36% participated in school lunch 1-4 times per week, and 37% didn't participate in school lunch.

The participants that ate school lunch (67% of students in this study), had the highest level of agreement “service is friendly” (3.92 ± 0.96), “enough time to eat” (3.96 ± 1.08), and “can spend time with my friends” (4.09 ± 0.98), on a five star Likert scale (mean \pm SD). In contrast, the same group of students rated the areas of the “food is appealing” (2.42 ± 1.03), “the food has a homemade quality” (2.07 ± 1.01), “the meal fills me up” (2.39 ± 1.12), and “I would recommend my friends to get school lunch” (2.21 ± 1.02) as lowest among all areas of the lunch program (mean \pm SD).

Of the students who did not participate in school lunch (nonparticipants), 85% (n=339) reported they do eat during the lunch period. Of those, 37% (n=148) eat food from home and the other 63% eat off campus at a restaurant. School lunch, however, was not foreign to these students as 49% of current non-participants reported eating a school lunch during the previous school year. When non-participants were asked to select what improvements would influence them to choose school lunch, specific qualities of the food such as taste (identified by 64% of students), appearance, and meals similar to off campus, as well as day to day variety, and the meal filled me up were commonly identified. Optimistically, only 18% of non-participants reported that they would not eat school lunch regardless of what improvements were made. In addition, many of the options for improvements were not commonly selected by nonparticipants. These included: the “menu item didn’t run out”, “time to spend with friends”, friendly foodservice staff, enough time to eat, and food available outside of lunch hours.

Conclusion: This study collected insightful and valuable data to understand student satisfaction and desires in numerous areas of the school lunch program. Studies similar to this can be helpful in measuring student satisfaction and understanding students' perception of the school lunch program. Taking into account student feedback, School Food Authorities can focus on specific areas to implement purposeful improvements to the school lunch program. Measuring students' satisfaction and participation in the school meal program after implementing specific changes can be helpful to gauge the impact of the improvements. In addition, continual research with students will not only identify new areas of improvement, but the feedback can aid the foodservice department in determining the next course of action.

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TABLE OF CONTENTS

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Chapter

I. Introduction	8
Primary Research Question	10
Secondary Research Questions.....	10
Limitations.....	11
Delimitations.....	11
Assumptions.....	12
List of Definitions.....	13
II. Review of Literature	15
Introduction	15
Background.....	16
Current Literature.....	20
<i>Development of standardized surveys to measure high school student</i> <i>perception and satisfaction.....</i>	20
<i>Factors related to satisfaction among those participating in NSLP.....</i>	26
<i>Factors that influence student perception.</i>	33
<i>Non-participants' perceptions and attitudes on not eating school meals..</i>	33
<i>Parents' perception of the school lunch program</i>	35
Discussion.....	39
Conclusion	42
III. Methods.	45
Subjects.	45

High school students' perception of school lunch program	6
Study Protocol	46
<i>Questionnaire tool</i>	47
Data collection.....	49
Data analysis	50
IV. Results.	52
General demographics.....	52
Study Sample	54
School Lunch Participants.....	56
School Lunch Non-Participants	60
Students' Interest in other Entrees	64
V. Discussion.....	66
Key Findings from School Lunch Participants.....	67
Key Findings from Non-Participating Students	69
A Comparison of the Non-Participants and the Participants	72
Future Research	73
Strengths & Challenges.....	75
Conclusion	76
VI. Implications & Recommendations for the Food Service Department.....	78
Bibliography	83
Appendix	
A. Notice to Parents : Food Service Student Survey October 2016	86
B. Assent Statement.....	87
C. The School Lunch Experience Survey (ICN)	88

High school students' perception of school lunch program	7
D. The Non-Participation Survey: Understanding Why High School Students Do Not Eat School Lunches (ICN).....	90
E. District High School student lunch survey.....	92
F. School Lunch Survey Report.....	94

CHAPTER 1: INTRODUCTION

The United States Department of Agriculture (USDA) funds numerous meal programs, including the National School Lunch Program (NSLP), which was established in 1946. The goal of the NSLP is to provide healthy balanced meals to school age children at free or reduced costs, for those that meet income eligibility criteria. According to the USDA, the NSLP provided over 31 million lunches in 2012 to students each day (2013). In Wisconsin alone, 2,525 schools participated in the NSLP in the 2011-2012 school year (Food Research and Action Center, 2013). In general, over half of public school students eat lunch at school. Data from the 2009-2010 school year showed that 63% of public school students consume school lunch (Fox, Condon, Crespinsk, Niland, Mercury, Forrestal, Cabili, Oddo, Gordon, Wonzy, and Killewald, 2012). With regard to student participation, research has found that elementary students participate in the school lunch meal program more often than high school students; and those receiving free or reduced price meals participate more often than students who pay full price.

A school food authority (SFA) is a foodservice operation that participates in the USDA funded NSLP and provides meals to students, following the NSLP requirements. In turn, the SFA claims these meals to their state agency for reimbursement revenue. In this type of operation, school foodservice becomes a unique business where students are the customers. More students participating in school meals generates more reimbursement revenue for the business to operate. School foodservice operations engage in a balancing act of offering foods that students recognize and like, foods that

fit in the meal regulations, and at the same time being fiscally responsible and practical in using the staff and equipment within their operation. In addition, school foodservice must compete against other options for meals, including meals from home, and nearby restaurants and businesses available during open campus lunch periods. All high schools in the district operate with an open campus during the lunch periods. This is similar to districts nationwide, as almost 41% of the largest districts nationwide operate with open campus lunch periods at the high school level (School Nutrition Association, 2016). Overall, the SFA has an important job to feed students, but faces many challenges in doing so.

As mentioned earlier, older students participate in school lunch less frequently than younger students. These students often have access to more lunch options, as open campus lunch periods are common among middle and high schools and also are becoming more independent in making decisions. Understanding and proactively addressing students' satisfaction and requests is essential for a school foodservice operation to have high customer retention and thrive as a business.

The rationale for this research is to understand student satisfaction with school meals, the factors that influence whether high school students eat or not eat school lunch, and identify changes that would encourage them to participate. Results from gathering this data would impact the students, school foodservice department, school district, and other similar operations. For the students, providing feedback is an opportunity to voice their opinion, and be involved in making changes that would positively affect them. For the school foodservice department and school district, identifying the current reality of the program allows them to understand their customers'

perspectives, identify areas of improvement, and make changes to enhance the program. This could lead to increased customer satisfaction and student participation, in turn generating more revenue by means of state reimbursement. Lastly, the study provides a foundation for future studies to grow upon. For other districts, similar research could assist them in identifying the current state of their program, identify successful aspects as well as areas of improvement specific to their programs, and allow them to compare their program against others.

Primary Research Question

How does student perception and satisfaction of school lunch among those participating in the school lunch program differ from their non-participating counterparts, among a convenience sample of high school students in four schools, using a satisfaction questionnaire?

Secondary Research Questions

1. What are the top contributing factors that would encourage high school students to choose school lunch more often?
2. How do the students eating school lunch rate the current state of the program?
3. What types of foods are students interested in?

Limitations

Limitations in this study would include the constraints of the cross sectional study design and in using a questionnaire tool. In studying a population at a specific point in time, the data cannot prove cause and effect interpretations. For example, students who don't eat lunch may feel the taste of the food is poor. However, this does not prove that the students do not eat because the food tastes bad. It could mean that the students who don't participate in school meals believe that the food tastes bad, without ever trying it. Also, if the research were subsequently repeated, the target audience would not be the same subjects from the initial study. In this scenario, if a change was made in the lunch program and the study was repeated, the most recent study may not find an increased satisfaction to justify that the change showed higher student satisfaction. In addition, limitations to using a questionnaire tool include potential bias of the sample, respondents, and responses. Along the same lines, the questionnaire may not be able to cover all themes of the school lunch program that influence high school students. Since this study is involving student opinions, parental consent or notification may be required to gather student data and responses. Lastly, gathering personal data, such as ethnicity and eligibility for free or reduced meals may be too invasive and require a more complex study design and approach.

Delimitations

Delimitations include which schools are studied. Since this research is focused on high school students only, input from elementary and middle school students will be left out. Furthermore, this study is gathering input from four high schools using identical

menu offerings, leaving out a student input from a charter high school with a completely different menu. Also, the study is being done in a district that manages its own foodservice operations. Therefore, this particular study does not include other operations, such as those provided by a Food Service Management Company. Additionally, since this study is being done in a specific school district, the results may not represent other districts across the state, or nation. Lastly, the study will be executed in a public school district, and therefore students from private schools are not represented.

Assumptions

Assumptions include that students who participate in the survey can understand the survey questions, are honest in responding and give appropriate and varied answers. Since some questions on the survey use the same introductory statement, it is assumed that students will answer each question separately, rather than marking the same response for the entire section. Lastly, it is assumed that students will want to provide feedback. If students are not interested in taking the survey, responses and data will be lacking.

List of Definitions

Applied Research Division (ARD): A division of the Institute of Child Nutrition

Average Daily Participation (ADP): The number of enrolled students eating school lunch

District: The public school district located in northeast Wisconsin, comprised of 41 schools and more than 21,000 students ([REDACTED], 2015-16).

Institute of Child Nutrition (ICN): A national center, part of the University of Mississippi established in 1989 and funded by the USDA, that is committed to applied research, education and training, and technical assistance for child nutrition programs. Their mission is "to provide information and services that promote the continuous improvement of child nutrition programs" (University of Mississippi, 2016). Formerly known as the National School Foodservice Management Institute.

Meal pattern: Regulations regarding the components of a meal and the specific amounts required daily & weekly in each food group, as set by USDA for each specific meal assistance program.

National School Lunch Program (NSLP): A USDA federally funded meal program that is operated in schools to provide children with a nutritionally balanced meal, at a low or no cost to students who are eligible. The USDA provides reimbursement to school districts for meals served.

Non-Participant: A student who does not eat school lunch.

Offer Versus Serve (OVS): A concept that allows students to decline some of the foods offered, as long as students select a reimbursable meal.

Reimbursable meal: A meal that is claimed to the state agency for reimbursement. At lunch a reimbursable meal must contain at least 3 of 5 food components (food groups), and one of those must be at least ½ cup portion of fruit and/or vegetables.

Participant: A student who eats school lunches.

School Food Authority (SFA): A foodservice operation that participates in any USDA funded meal programs and claims meals to the state agency for reimbursement

High school students' perception of school lunch program

14

United States Department of Agriculture (USDA): The federal entity that funds numerous meal programs, including the National School Lunch Program, and specifies regulations of each program.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

School meals are an important part of any student's day. Meals during the school day provide the energy and nutrients that students need to grow and learn. The United States Department of Agriculture (USDA) funds numerous food programs in schools, including the School Breakfast Program (SBP), National School Lunch Program (NSLP), Child and Adult Care Food Program, Special Milk Program, Summer Food Service Program, and the Fresh Fruit and Vegetable Program. Each of these programs are administered by state agencies and reimbursements are provided to organizations that provide nutritious meals to children in an effort to fight hunger and reduce obesity (Food and Nutrition Service, 2015). The NSLP was established in 1946 by the USDA, and aims to provide balanced and healthy meals to children at a reduced or free cost. Many school districts participate in federally funded meal programs. According to the Food Research and Action Center (2013), data from the 2011-2012 school year show that 87,936 and 98,347 schools participated in the SBP and NSLP across the United States, respectively. Furthermore, in Wisconsin, 1,799 and 2,525 schools participated in the SBP and NSLP during the same year (Food Research and Action Center, 2013).

Numerous school districts offer multiple programs, and with a growing rate of food insecurity, many students eat more than one meal at school. The most recent USDA Food and Nutrition Service School Nutrition Dietary Assessment IV study, published by the USDA in November of 2012, demonstrated an average of 63% of

students in public schools participated in NSLP in the 2009-2010 school year (Fox, Condon, Crespinsk, Niland, Mercury, Forrestal, Cabili, Oddo, Gordon, Wonzy, and Killewald). Elementary schools had the highest participation rate of 70% versus students in high schools, of whom 45% participated in the lunch program. In addition, students with free or reduced eligibilities participated at an increased rate (79% and 73% respectively) compared to students who paid full price for their meals (48%) (Fox et al., 2012). Data from 2005 shows that 29.6 million lunches were served in the NSLP during the 2004-2005 school year. Of those, over half (59%) were provided to students at a free or reduced price (Gordon, Fox, Clark, Nogales, Condon, Gleason, and Sarin, 2007). School meals are offered and utilized by many students in numerous districts throughout the United States. These meals provide essential nutrition to all students, some of which at reduced prices. School meals are nutritious as they adhere to the nutrition recommendations of the Dietary Guidelines for Americans, developed by the Institute of Medicine.

Background

In 2010, the Healthy, Hunger-Free Kids Act (HHFKA) was passed, which reauthorized the USDA child nutrition programs, including the SBP and NSLP. This was the first change in school nutrition regulations within the previous 15 years. Prior to this legislation, school meals were not subject to critical nutrition standards. Minimum amounts of fruits and vegetables were established, but did not ensure variety. Whole grains were encouraged, but not required, and all types of milk including whole (fat),

could be served. The HHFKA required USDA to update the nutrition standards for school meals. A committee at the Institute of Medicine (IOM) was formed to evaluate the nutritional needs of schoolchildren based on the latest public nutrition recommendations from the IOM- the 2005 Dietary Guidelines for Americans (National Academy of Sciences, 2010). Using the results of the review, the committee was responsible for recommending revisions to the nutrition standards and meal requirements of the NSLP and SBP.

The updated regulations were created to promote healthy lifestyles and provide children with access to healthy food, regardless of income (ChangeLab Solutions, 2012). Furthermore, this legislation set specific meal pattern regulations for all foods and beverages available on the school campus by districts claiming for reimbursement, beginning in the 2012-2013 school year. The focus of these nutrition standards was to increase the variety of fruits and vegetables offered, require all grains to be whole grain rich and milk to be nonfat or low fat (1%). Foods must be offered in specific amounts daily and weekly, and offering a variety of vegetables, categorized by subgroups, are required throughout the week. In addition, ranges for calories, and limits for saturated fat and sodium were established. Foods with more than zero grams of trans-fat per serving were eliminated, and a timeline was set to implement these changes over a 10 - year span (ChangeLab Solutions, 2012).

These regulations categorized foods into five different components- meat/meat alternate, grain, fruit, vegetable, and milk. Additionally, the ruling allowed school districts to participate in an option called Offer Versus Serve (OVS). Under OVS, students must select at least three of the five meal components (food groups), with one

of those being a half-cup of fruit or vegetable, to count as a reimbursable meal. The perceived advantage of choosing to utilize the OVS option is to give student's choices, and decrease food waste resulting in lower food costs.

In response to the HHFKA regulation, the Food Service department of the district made numerous changes. First and foremost, menu planning was centralized to provide meals that fit within the nutrient standards for each grade grouping. In addition, products were switched to healthier options. For example, a cream cake base that was used to make muffins was removed, and 100% white wheat flour was used instead, creating a made from scratch muffin. All grain products were switched to meet or exceed 51% whole grain, meeting the definition of whole grain rich. Lastly, OVS is used in all meal services in each school, giving students choices.

School foodservice is a unique operation. School Food Authorities (SFA) must break-even financially using reimbursement revenue generated by student participation in meals, in comparison to labor and food costs. In this business, students are the customers, whose participation and satisfaction drives revenue. SFA engage in a balancing act between offering foods students recognize and like, offering foods that fit the USDA meal pattern regulations, and at the same time being fiscally responsible and practical in using the staff available in their specific type of operation. In addition, school foodservice must compete against other options for meals, including foods from home, and foods available for purchase inside and outside of school, especially in districts with a la carte sales and/or an open campus, where students are allowed to go off -campus during the lunch period. The purpose of the NSLP in providing healthful meals to school age children can only be met if students participate in these programs.

Parents are influential in their children's lives, both in supporting ideas and in discouraging others. Therefore, parents and other adults that play a vital role in student's lives are key stakeholders and their perceptions are the basis for promoting ideas to their students. If parents are satisfied and supportive of a particular program, that positive energy is likely passed on to the youngsters in their lives. On the other hand, if parents feel negatively toward a particular subject, that disapproval is also passed down. Understanding parent's perception of a school meal program can add valuable insight, and identify the representation construed by the general public. Educating adults and parents to promote student wellness is essential as parents can lead major changes, including educating the public, correcting misconceptions as a partner in supporting school meal programs.

As mentioned previously, participation in the NSLP is lower in middle and high school students than their elementary counterparts. These students are becoming more mature, and using their freedoms to make independent decisions. Therefore, this group of students is an excellent group to study in an effort to determine what factors influence their participation in school meal programs. By assessing students' satisfaction and addressing their concerns proactively, school nutrition professionals can use their customer's input to empower them and improve the program, which could lead to increased student participation and reimbursement revenue. Additionally, gathering adult opinions from teachers and parents can aid in educating the general public and promoting the school meal program as appealing to students. The purpose of this review is to analyze current literature to identify factors that influence middle- and high

school students' participation in school meal programs, including their degree of satisfaction with the program, and parent perspectives.

Current Literature

Development of standardized surveys to measure students' perception and satisfaction of school lunch

As students are the primary customers of school meals, understanding their perspective is critical in measuring the success of the foodservice operation and the ability to retain customers. In 2010, authors published a study in which they created, validated, and administered a survey to high school students who didn't participate in the NSLP (Asperin, Nettles, & Carr). The purpose was to identify reasons that students didn't participate and gather suggestions for improvement. Researchers gathered qualitative data through the use of focus groups with high school students and school nutrition professionals separately, to develop the survey. After that, pilot tests were used to enhance and validate the tool. School districts chosen for both the focus groups and survey testing were selected for variations in district size, ethnic diversity, demographics such as percent of students eligible for free and reduced meals, and USDA region (Asperin, Nettles, & Carr, 2010). School nutrition directors had a passive parental consent template, and parents were informed that their child had the right to decline participation at any time. Participant consent statements were read at the beginning of each of the focus groups and survey gatherings.

In phase one of survey development, six to eleven participants from four districts gave input during eight focus groups. Each district hosted a student focus group and a school nutrition professional focus group. School nutrition directors recruited high school students to participate, and referred eight to ten district school nutrition staff and also invited school nutrition staff from neighboring districts to the focus groups. The focus group used a variety of semi-structured and open ended questions to promote discussion, which lasted about 90 minutes. In the high school focus group, questions were related to why they chose to or chose not to eat school lunches, meaning of quality, value, healthy meals, and choices, parts of the school lunch they did or didn't like, and additional thoughts or opinions (Asperin, Nettles, & Carr, 2010). Focus groups with school nutrition staff centered around their roles in providing an enjoyable school lunch experience, perceptions on why students chose not to participate, and current techniques to address non-participation at the high school level. Responses from both focus groups were summarized and put into categories in order to determine themes used to draft the survey.

Student focus groups were conducted in districts with extremely varying qualities. The number of high schools per district ranged from 1 to over 30, the enrollment ranged from about 500 to nearly 3,000 students, and the percentage of students eligible for free and reduced meals varied from less than 5% to over 80% (Asperin, Nettles, & Carr, 2010). Of the four districts involved in focus groups, two of them had closed campuses, one had an open campus, and the last had open options for students (Asperin, Nettles, & Carr, 2010). In the focus group discussions amongst students, those who ate lunch more frequently had differing concerns from those who ate less frequently. Non-

participating students noted reasons for doing so, which fit into eight categories. These themes included choices and variety, taste, appearance, customer service, quality, nutrition, value, and don't want to eat (Asperin, Nettles, & Carr, 2010). In the focus group with school nutrition professionals, five themes emerged. These include social influence and negative stigma, lack of time, overcrowded dining space, perceived poor quality and healthfulness, and access to other foods through open campus or open option policies (Asperin, Nettles, & Carr, 2010). In addition, the majority of school nutrition professionals agreed that students are accustomed to and expect meals similar to commercial foodservice and professionals should be taking this into consideration. School nutrition professionals also felt that gathering student feedback was important and necessary to increase participation (Asperin, Nettles, & Carr, 2010).

After the focus groups, the drafted survey was created. The survey contained three sections. The first section required students to choose their level of agreement with 68 statements using the phrase, "My reason for not eating school meals is that...". The statements were written in the negative so students could easily relate to them and the level of agreement used a 5-point scale, with 5 being strongly agree and 1 as strongly disagree. The second section of the drafted survey contained 21 statements that could influence the student's decision to eat school meals. Students were asked to use the phrase, "I would be more likely to eat school meals if..." to show to what extent each of the 21 statements would influence them to eat school lunch. This section again used a 5-point scale, with 5 being absolutely yes and 1 being absolutely no. In the last section of the survey, students were asked to rank the importance of eight statements on why they do not eat, again using a 5-point scale with 5 being very important and 1

being not important (Asperin, Nettles, & Carr, 2010). To control for response bias and decrease measurement error, student surveys with substantial missing data, poor variability or extreme responses were removed from the sample before analysis (Asperin, Nettles, & Carr, 2010).

In phase two of the study, the survey was tested out in three different stages with different students surveyed in each stage. School nutrition directors used a computer-generated report to identify non-participants (participating 2 or less times per week), and selected a group of non-participating students to complete the survey. Surveys took roughly half an hour and were administered by a school or foodservice staff member during a class period in the school day. A total of sixteen districts, with 25 high schools, participated in the pilot testing of the survey. Demographics for this group included an average school enrollment of 1,345, an average of 48% of students approved for free and reduced meals, and 68% of schools had a closed campus (Asperin, Nettles, & Carr, 2010). Researchers noted that daily participation rates for those with closed campuses were 49%, whereas those for open campuses averaged 41% (Asperin, Nettles, & Carr, 2010). Statistics used to analyze survey responses in the three stages of pilot testing included tests for multivariate and univariate outliers, exploratory factor analysis with varimax rotation, confirmatory factor analysis, and descriptive statistics such as means, frequencies, and standard deviations.

The first stage pilot test was used to evaluate the student's understanding of the instrument and the survey procedure. In this stage, the number of statements in section one of the survey was condensed from 68 statements down to 39. Likewise, the number of statements in section two was reduced from 21 items to 13. Also, the scale for

section two was changed from 'absolutely yes' and 'absolutely no' to 'strongly agree' and 'strongly disagree' a 5-point scale. Lastly, the entirety of section three was removed (Asperin, Nettles, & Carr, 2010). The second stage of the survey pilot examined the factor structure of reasons students didn't participate. The first section was reduced farther, this time from 39 down to 32 items, and the anchor statement was changed to emphasize school lunches rather than school meals, as suggested by school nutrition professionals (Asperin, Nettles, & Carr, 2010). As a result of advice from school nutrition professionals, a new third section was added to the survey to collect demographic data. The third stage of the pilot survey tested the validity and reliability of the instrument. In this stage, section one was further reduced to 27 items.

Two years after publication of high school surveys, Castillo and Lofton developed and validated two surveys for middle school students to gain insight into the factors that lead to their participation in and satisfaction of the NSLP (2012). Their purpose in developing the surveys was similar; to enable School Nutrition professionals to use these to gauge student opinion to improve the program. One survey was called the Participation survey, intended for students who regularly participated in school meals, which measured the student's perception and satisfaction with meals. The other survey, deemed the Non-Participation survey, was created for students who didn't regularly participate in school meals in order to find the reasons they didn't eat school lunch. In addition, researchers used these surveys to collect information to determine the factors that influence both participants and non-participants' satisfaction with the NSLP (Castillo & Lofton, 2012).

Development and validation of the surveys was completed in two phases. In phase one, researchers utilized qualitative data, which consisted of themes from a prior focus group, and two surveys already developed for high school students, to draft the surveys for Middle school students. The drafted surveys contained three sections. The first section listed 24 statements regarding specific reasons why students do or do not participate in the NSLP. These statements were rated on a 5-point scale with 1 being strongly disagree and 5 being strongly agree. In section two, the survey asked students to choose the top 5, of 14 available reasons, why they chose or would encourage them to choose school lunch more often. The last section included demographic data; grade level, gender, and the number of times per week they participated in school lunches. Phase two consisted of two different stages to pilot test, refine and validate the drafted surveys (Castillo & Lofton, 2012). The intention of stage one was to test how the survey was administered and assess the student's understanding. At that point, the survey was piloted to fifty-six students in one USDA region, where students were asked to be honest and provide feedback on the instructions, statements and scales used in the tool. Upon completion of stage one, no changes were made to the drafted surveys. In stage two, 1,711 surveys were sent to School Nutrition Directors to survey students who were randomly chosen by the point of sale software as participants and non-participants.

From the 1,711 surveys distributed, 1,402 of them were completed and returned from 22 schools within 12 districts across the 5 USDA regions. Descriptive statistics, exploratory factor analysis, Cronbach's alpha, independent sample t-tests, and one-way ANOVA with Tukey's post hoc test were used to analyze the data (Castillo & Lofton,

2012). The demographic information ranged vastly in this sample group. The average enrollment was 600, with a range from 143 to 1060 students and the average daily participation in school meals was 64%, ranging from 36% to 92% (Castillo & Lofton, 2012). In addition, the percentage of students eligible for free meals ranged from 7% to 80% and reduced meals from 5% to 22% (Castillo & Lofton, 2012). Lastly, the majority of students that completed the surveys were female (50.4% of respondents in the participant survey and 63.2% of respondents in the non-participant survey) and the sample was distributed among 6th, 7th, and 8th grade participants (Castillo & Lofton, 2012).

Factors related to satisfaction among those participating in NSLP

In analyzing the data from the high school and middle school surveys, researchers gained information as to why students participate in meals. A total of six significant factors related to lunch participation emerged from the High school survey analysis. These include food quality, dining area capacity, food from home, staff, schoolwork, and food access (Asperin, Nettles, & Carr, 2010). Of these factors that emerged, the most common one that influenced participation was food quality, including taste, aroma, and appeal, followed by food choices, overall quality and food access, relating to portion size and foods available during the lunch service (Asperin, Nettles, & Carr, 2010).

Results from the middle school participants' survey showed that the highest rated characteristics that affected the student's lunch experience included socializing with friends, food choices change daily, and the menu offers healthy choices (Castillo &

Lofton, 2012). Researchers concluded that the students agreed with the majority of the statements, as 21 of the 24 statements had a mean rating of 3 or more. The top reasons participating students ate school lunch included [they were] hungry, [get to] sit with friends, didn't bring food from home, [have] energy for the rest of the day, and have no choice (Castillo & Lofton, 2012). Analyzing participants' responses yielded two factors- food preferences and staff attentiveness. Here, reasons for eating school meals from middle school participants included concepts related to both the food itself, including variety and healthfulness of choices, as well as the social experience of eating lunch with peers.

The third School Nutrition Dietary Assessment study, published by the Food and Nutrition Service of the USDA in 2007, was another study that sought to discover student participation rates in meal programs and gather information related to student and parental perception of school meals. For this study, researchers used a multistage sampling approach, as they sampled SFA, then schools in those SFA, and enrolled students in those schools, across the continental United States (Gordon et al., 2007). Each SFA selected an elementary, middle and high school for the sample. Students within each school were randomly chosen to complete a 24-hour dietary recall interview, with one or both parents/guardians to assist, if available. Students were asked questions regarding their participation in school meals, their opinion of school meals, eating environment, supplement use, and physical and recreational activities. A second 24-hour dietary recall was completed with a subsample of students to account for the variability of student intakes (Gordon et al., 2007). On the day of student interviews, students were randomly ordered, and called out of class for their interview. If the

student was not available, the next student was called. Researchers used randomly chosen substitutes to replace data for SFA, schools and students who declined to participate (Gordon et al., 2007). In all, student data was collected in 94 SFA at 287 schools. A total of 2,709 students and 2,330 of their parents were interviewed (Gordon et al., 2007). The final analysis sample included responses from 2,314 students who completed the dietary recall and whose parents completed the interview, along with 666 of the 880 students who completed a second dietary recall (Gordon et al., 2007).

In this nationwide study, students reported numerous reasons for participating in the NSLP. The most noted was due to being hungry (35%), liking the food overall (21%), and liking what was on the menu (13%) (Gordon et al., 2007). Overall, students were largely satisfied with the dining atmosphere. Two-thirds of them noted that tables were always or usually clean, 54% agreed the noise level was satisfactory, 79% stated there was adequate seating, and 74% of students indicated they had sufficient time to eat their lunch (Gordon et al., 2007). In addition, about half of students who reported that they've tried a school lunch stated that they liked it. In this large study, participant's responses centered on being hungry, and liking the taste and the variety of foods available on the menu.

Meyer and Conklin sought to investigate student's satisfaction with the NSLP and determine if it was related to their participation in the NSLP in 1998. In the introduction of their published article, they noted that high school students are "sophisticated", as they are familiar with and have access to a wide array of flavors and dining experiences, including fast food joints, ethnic foods, and convenience. Researchers used a 38 - question survey to gather information, which measured students' overall satisfaction

with the school foodservice, perception of the food variety, services, and eating atmosphere, and also gathered demographic data. A 7-point scale was used for responses, with 1 being the lowest (very unhappy, strongly disagree, poor) and 7 being the highest (very happy, strongly agree, excellent) along with an "I don't know" option. The study was approved by the University's Human Subjects Committee and deemed non-invasive, therefore student waivers were not needed.

The sample in this study consisted of 9 high schools in Alabama, Texas, Kansas and Delaware. School nutrition professionals contacted principals to distribute the surveys to 9th through 12th grade students during the school day in multiple classrooms to capture the highest amount of responses. A total of 1,823 completed and usable surveys were received. Surveys with 6 or more "I don't know" responses were removed from the analysis, as those surveys skewed the curve away from the mean (Meyer & Conklin, 1998). For surveys that contained between 1 and 6 "I don't know responses", researchers used the school mean in its place. Researchers found that students who had little control over whether or not to eat lunch, responding to the question "The number one reason I eat school lunch is.." with "my parents make me" had significantly ($P<.001$) different responses in the rest of the survey (Meyer & Conklin, 1998). Therefore, this selected group of surveys from 440 students, was analyzed separately from the group of 926 students who answered "have a choice". Then researchers used a t-test to determine if students who ate school lunch frequently (3-5 times a week), differed in their perception and satisfaction of the school foodservice program compared to the students who didn't participate as often. Students who ate school lunch

sometimes (1-2 times per week) were not included in the analysis (Meyer & Conklin, 1998).

A significant ($P < .01$) difference was found between the students who didn't eat school meals and those who frequently participated related to dining ambience, food quality and foodservice staff (Meyer & Conklin, 1998). When analyzing student responses, in both the "had a choice" and "had no choice" groups, satisfaction was significantly correlated with the variety of food offered ($P < .05$) and was deemed to be the best indicator among both groups (Meyer & Conklin, 1998). For the "had a choice" group, attractiveness of serving line, flavor of food, and quality of food choices, choices to meet cultural and ethnic preferences, staff courteousness, and quality of ingredients were the following indicators of satisfaction and significant ($P < .05$) (Meyer & Conklin, 1998). Similarly, in the "had no choice" group, flavor of the food, quality of food choices, foodservice staff listen to students, special events offered, number of serving lines, and choices to meet religious needs were significant indicators of satisfaction ($P < .05$) (Meyer & Conklin, 1998). Overall, dining environment, quality of food, and interactions with foodservice staff were differences between students who participated in school meals versus their non-participating peers. Furthermore, among students who had a choice in eating school meals and those who didn't, the food's flavor and variety of choices, as well as interaction with foodservice staff were significant influencers of satisfaction. It is important to note that in discussing the study, researchers addressed that students who ate more frequently were more satisfied, but could not prove whether satisfaction was determining participation or participation was driving satisfaction.

A study done in the Cincinnati Public Schools also yielded student input on the lunch program. A total of 1,804 students from eight high schools were randomly selected to complete a questionnaire to provide their opinions, feelings and attitudes of the school lunch program. The students were selected from amongst four homerooms and classes to fill out the questionnaire with a comment sheet, along with demographic information. The responses were written on a standardized computer sheet, which was scanned and data was analyzed using t-tests, f-tests, and chi-squared. All of the high schools had a closed campus policy, where students were not allowed to leave the school during lunch periods. Options during lunch included common lunch meal, as well as a la carte items. Among the eight high schools, there was an average of two lunch periods, which lasted 30 to 35 minutes, and included an average of three serving lines (Marples & Spillman, 1995). In the Cincinnati Public School district, there are 55,000 students, of which 10,550 are high school students. Of these students, 31% were eligible for free or reduced priced lunches and the majority (62%) of students were black, followed by 36% who were white. Among students who completed the survey, each grade was nearly equally represented. Of the students who took the survey, 257 and 47 qualified for free and reduced meals, respectively and 845 of them participated in school meals (Marples & Spillman, 1995).

Responses from students showed that although the school had a closed campus policy, 41% of students said they ate off campus at local restaurants at least once a week. In addition, 58% of students replied that they didn't eat lunch during the week, whereas 15% of students ate the school meal on a regular basis (Marples & Spillman, 1995). Other students (22%) indicated that they consumed meals from home two or

more times weekly (Marples & Spillman, 1995). One significant factor in influencing participation was food quality. A large percentage (43%) of students rated the quality of food as poor, while 23% reported the food quality was fair. Only 5% of students rated food quality as good. Students who participated in school lunch rated the food quality higher than their nonparticipating counterparts, including the free and reduced nonparticipants (Marples & Spillman, 1995). Another significant factor was variety of food offered, according to participants and nonparticipants alike. Similar to the quality of food, 73% of students said they would participate more often if the more variety was offered. Also, both participants and free and reduced nonparticipants felt the duration of the lunch periods was too short, as reported by 82% and 66% respectively (Marples & Spillman, 1995). Overall, most of the students found the customer service by lunchroom staff to be satisfactory.

Among the many areas covered by the questionnaire, numerous ones were noted by students, but not statistically significant in influencing participation. Students felt that portion sizes were too small and prices of school lunch were too high, but neither of these were significant in influencing student participation. Student responses showed that they preferred pizza, burgers, fries, tacos and salad. However, some of these same items were also listed as least favorite by a smaller percentage of students, due to the fact that they were repeatedly offered (Marples & Spillman, 1995). Surprisingly, responses from students didn't indicate peer pressure as influencing their participation either. A large percentage of students (42%) reported that they wouldn't participate in school lunch more often, even if their friends did, and 39% responded that their friend's participation didn't influence their participation at all (Marples & Spillman,

1995). Lastly, many students didn't consider the lunch meal to be nutritious, however this was not statistically significant.

Factors that influence student perception

Researchers have been studying students' opinions about school lunches for a long time. Participants in the three aforementioned studies had numerous reasons for eating school lunches. Factors related to the food, such as variety of choices, quality, taste/texture, and healthfulness, as well as interactions with foodservice staff and the dining experience, including attractiveness and number of serving lines and ability to eat with friends, are influencers to eat school meals, as described by participants. With this information, school foodservice operations can create continuous improvements plans specific to the factors that influence student perception and satisfaction.

Non-participants' perceptions and attitudes on not eating school meals

Nearly each of the studies described earlier also studied non-participant's responses to gain insight as to why this select group of students didn't participate in school meals and identify possible improvements that would encourage them to participate. In the largest of the aforementioned studies, the School Nutrition Dietary Assessment study found that reasons students didn't participate included bringing lunch from home (28%), not liking what was served that day (20%), and not liking school lunch in general (9%) (Gordon et al., 2007). Along the same lines, after administering the newly created middle school survey, researchers found that non-participants didn't eat school lunch due to long lines, preferring food from home, and feeling that the food

was not fresh (Castillo & Lofton, 2012). In analyzing these student's responses, food quality and customer service were two factors that emerged. Likewise, high school students shared that dining space, food from home, and interaction with school nutrition staff were common reasons students didn't participate (Asperin, Nettles, & Carr, 2010). The variety of reasons that students didn't participate in meals is evidence that the school meal program is a complex system, in which many factors play a role in whether or not a student participates. Oftentimes, food preferences, lunches from home, convenience and customer service interactions were reported as rationales to not participate in school meals.

Authors from the School Nutrition Dietary Assessment study noted that student satisfaction of school lunches declines as students get older, as 56% of elementary students reported liking school lunch, compared to 35% of middle school students, and 32% of high school students agreeing (Gordon et al., 2007). When asked for more specific details, more than half the students described that they were only sometimes or never satisfied with the flavor, appearance, and aroma of the food (Gordon et al., 2007). In addition, over the half the students mentioned wanting more lunch choices on a daily basis. Here, the data suggests that a high level of emphasis is on the food itself- its flavor, smell, and appeal to the senses. Additionally, differing the choices from day to day would keep the menu from becoming monotonous.

In an effort to encourage non-participants to eat school meals, students were asked their opinions on how to improve school meal programs. Non-participants at the middle school level noted better tasting food, shorter wait time, better quality food, more food choices I like and fresher looking food as solutions that would encourage them to

participate more (Castillo & Lofton, 2012). Data from high school students showed that students would be more likely to eat if the food quality was improved, more day-to-day variety was provided, and the wait in line was shortened (Asperin, Nettles, & Carr, 2010). Similar responses were found in the Cincinnati Public Schools research. When nonparticipants were asked if they would consider participating if the quality of meals was improved, 64% agreed. In the subgroup of nonparticipants with free and reduced status, 61% of them said they would participate if the quality of meals were better (Marples & Spillman, 1995). In addition, among nonparticipating free and reduced students, 51% of them rated the variety as poor and 66% replied they would choose school meals more often if a better variety was available (Marples & Spillman, 1995).

Each of these potential improvements was listed as hindrances, or reasons why students don't participate in school meals. Therefore, improving the food itself, day-to-day variety, and convenience of faster lines could encourage non-participants to participate in school meals.

Parents' perception of the school lunch program

In the nationwide School Nutrition Dietary Assessment study, parents also gave insight as to why their child did or did not participate in school meals. Parents of students who did participate reported that school lunch was convenient (30%), their child liked the food (23%) and thought lunches were a good value (18%) (2007). Furthermore, parents of elementary and middle school students often mentioned convenience as the reason to participate in lunch program, whereas parents of high school students cited value as most important reason to participate (Gordon et al.,

2007). Parents of those who didn't participated noted reasons similar to their non-participating students for not eating school lunch, such as bringing a meal from home and not liking the school food (Gordon et al., 2007). In this same group, roughly half of the parents of non-participating middle and high school students noted that their students didn't participate due to a long wait in line and 68% of them were more likely to mention that their students didn't have enough time to eat.

Eighty-nine percent of parents' agreed school lunches were somewhat or very healthy, and 81% thought that meals were a good or pretty good financial value (Gordon et al., 2007). Overall parent satisfaction was high, as 33% of parents were very satisfied and another 52% were somewhat satisfied with the NSLP. In addition, 20% and 59% of parents, respectfully, strongly agreed and somewhat agreed, that their children enjoyed the school lunches (Gordon et al., 2007). Among dissatisfied parents, 48% believed that school lunches were not healthy enough, 38% felt school lunches were of poor quality or poor taste, 27% described the menu as lacking choices, and 18% noted their students wouldn't eat the school lunches (Gordon et al., 2007).

When parents were asked what they would like to see changed regarding school meals, they gave numerous answers, which were grouped into 31 categories. The top suggestions to improve school meals were to have healthier food (23%), more fruits and vegetables (20%), more variety (18%) and less fatty foods (9%). In addition, parents responded that they'd like to see more whole, fresh and less processed foods (8%), increased portion sizes (8%), additional time to eat (7%), and improvements in the overall quality of foods, such as food preparation, appearance, temperature, and flavor (6%).

In a more recent study published in the *Appetite* journal, a random phone survey was used to collect parent's perception of the nutritional quality of school meals and aimed to identify an association with student participation in the school lunch program. The goal of the study was to understand how the parent's perspective influences participation in the lunch program, in an effort to support the program and its changes under the HHFKA. The survey was completed by 1,708 households in five cities in New Jersey during 2009 and 2010, and conducted in both English and Spanish (Ohri-Vachaspati, 2014). To entice participation in the study, a \$10 incentive was offered to participants. Respondents were asked to choose one child in their household (aged 3 - 18 years) and answer questions related to the frequency of days the student eats school meals, the parent's perspective of the nutritional quality of school meals, and the student's eligibility in obtaining free or reduced meals, as well as demographic information. Survey participants were asked, "On most days, does [your] child have a lunch served by the school?" to determine if the student participated in the school meal program (Ohri-Vachaspati, 2014). Responses were coded for yes (1) or no (0) answers. Next, parents were asked "Regardless of whether or not index child eats food provided by his/her school, how would you rate the nutritional quality of foods offered at index child's school?" to gauge parent's view on a four point Likert scale ranging from very unhealthy (coded as 1) to very healthy (coded as 4) (Ohri-Vachaspati, 2014). Similar to the first question, parents were then asked if their child was eligible for free or reduced priced meals, and responses were again coded 1 for yes, and 0 for no. Descriptive statistics and bivariate analysis were conducted to analyze the data and determine association between students participating in school meals and the parent's view of the

healthfulness of the meals. The data was weighted to equally represent responses from among the five cities and significance was set at $p < .05$ (Ohri-Vachaspati, 2014).

Of the 1,220 responses, 60% of students were in Elementary school, nearly equal representation of gender (50.6% were male, 49.4% female), and 44.7% African American and 41.6% were Hispanic. Related to income and free and reduced meal price eligibilities, 75.8% of households were below 200% of the federal poverty level, and 70% of the students were eligible for free or reduced meals. Overall, most parents felt that the school meals were unhealthy, as 47.5% and 31.1% respectively described them as somewhat and very unhealthy. Student participation in school meals however was high, with 87.2% of responses indicating that their student eats school lunch. In analyzing the data further, data showed that a higher percentage of students whose parents thought the meals were somewhat or very healthy, ate lunch at school compared to children whose parents felt the lunch to be somewhat unhealthy (Ohri-Vachaspati, 2014). Furthermore, parents of students eligible for free or reduced meals rated the nutritional value of school lunches equally amongst the four categories, suggesting that eligibility does not influence parent's perception of healthfulness. The study found that the parent's perception of the nutritional value of school meals was a strong predictor of the student participation in school meals. Students whose parents felt the meals to be very (OR=0.40, 95% CI: 0.15-1.03) or somewhat unhealthy (OR=0.24, 95% CI, 0.11-0.53) had a lower odds of eating lunch at school, compared to their peers whose parents felt the meal was very healthy (Ohri-Vachaspati, 2014). In addition, students receiving free or reduced price meals were associated with higher odds of eating school lunches, compared to their peers who were not eligible for free or

reduced price meals (OR 5.59, 95% CI, 3.03-10.30). Data also suggested that African American and Hispanic students had significantly higher odds of participating in school meals than their white counterparts. The author determined that free and reduced eligibility played a role both students' meal participation and parents perception of lunch, however this interaction was not statistically significant (Ohri-Vachaspati, 2014). Overall, the study concluded that student participation in school lunch is independently associated with parental perception of healthfulness of meals, even after adjusting for demographics including free and reduced eligibility and race.

Parents are key stakeholders in encouraging their children to participate in school meals. They can model healthy behaviors at home and connect the messages of the NSLP to meals at home. It is important that parents are educated of the goals and benefits of participating in the school lunch program, in order for them to successfully educate their students and support the program.

Discussion

Among the four pieces of literature discussed, all focused on student perception of and participation in school meals. The published date for the articles varied, with the oldest from 1995, and the newest from 2012. It is important to note that the Healthy Hunger Free Kids Act was passed in 2010, and the regulations went into effect in school year 2014-2015. Therefore, the more recent studies were published soon before the changes were required in school meal programs.

Most of the studies used a survey tool to collect data from students, whereas the School Nutrition Dietary Assessment Study-III conducted 24 hour recalls and interviews with students to gather insight. In addition, that study collected opinions from parents, which is unlike the others. Being aware of parent insight can be helpful in promoting school meals and educating students perhaps by correcting negative misconceptions about school lunches. The study using the telephone survey to gain information on student participation and parental perception of the school lunch program was a cross sectional design, and therefore cannot prove cause and effect. Parents may rate the school meals as healthy because their students participate or students may participate because their parents view the meals as healthy. The author mentioned that regardless of the direction of the association, parents are considered vital in promoting continued participation in school meals, as they can encourage their children to eat school meals.

The School Nutrition Dietary Assessment Study-III is also strong as it was completed on a national level, whereas the other study was completed on smaller scale with schools in the southern and eastern United States. However, this nationwide study had some interesting and nearly opposing results. One of which is that the large majority of parents were generally satisfied with school meals and (81%) felt that school lunches were very or somewhat healthy. In the same study, 23% of the parents suggested improving the healthfulness of the food (Gordon et al., 2007), which seems contradictory.

Two of the studies focused on creating and validating surveys for School Nutrition Professionals to use as a tool to gather student perspectives on school lunches. Each of these focused on a specific grade group of students, middle or high

school, and developed separate surveys appropriate for students who participate and those who don't participation in school meal programs. Having separate surveys is important as Meyer and Conklin discovered different significant differences in perception of school meals among participating students and non-participants. These researchers found significant differences in satisfaction among students who participated in school meals versus their non-participating peers related to dining environment, quality of food, and interactions with foodservice staff.

Results of these studies showed a mixture of student satisfaction with school meals. On one hand, half of the students who ate a school meal responded that they liked it, and more than half also responded that they were less satisfied with the flavor, aroma and appearance of the food in the same study (Gordon et al., 2007). In addition, another study found that variety and flavor of the food were the top indicators of student satisfaction among all students (Meyer & Conklin, 1998). Authors Meyer and Conklin described the association that students who ate more frequently were more satisfied (1998). Rightfully so, these authors were straightforward in noting that this association does not determine cause and effect, and it is unknown whether participation drives satisfaction or vice versa.

Furthermore, most of the surveys also included other relevant topics such as the interactions with foodservice staff, and the dining experience, including the environment, cleanliness, and available time to eat. Both Meyer and Conklin, along with Castillo and Lofton found factors that related both food and customer service to student satisfaction. Staff courteousness, as noted by the "had a choice group", and "foodservice staff listens to students" as noted by the "had no choice" group, were significant indicators of

satisfaction (Meyer & Conklin, 1998). Along the same lines, staff attentiveness and customer service were two factors noted from participants and non-participants, respectively, in the study with middle school students. Therefore, how staff responds to students significantly affects student participation in school meals. Furthermore, in the study with high school students, six key issues related to participation and satisfaction were identified and categorized into those controllable by and external to the food program. Those internal to the program included the quality of food, access, and staff, whereas factors outside of control included dining area space, food from home, and homework (Asperin, Nettles, & Carr, 2010). Many factors, including those related to food, customer service, dining experience, and social aspects of eating, impacted student satisfaction with school meals.

Conclusion

Asperin and colleagues suggest that the overarching goal of the NSLP in meeting student's nutritional needs cannot be met if students don't participate in the program (Asperin, Nettles, & Carr, 2010). Therefore, opinions of students who don't participate in the program should be researched in order to provide useful information to improve the program and in turn, increase participation.

Meyer & Conklin reasoned that using information gained in studies, school nutrition professionals could make small deliberate changes to enhance the foods' appeal and offerings in order to increase student participation and provide nutrition to more students. Back in 1998, these researchers encouraged involving students in

bringing new ideas to the table and marketing enhancements of the lunch program to the student body. In a similar way, in the study with middle school students, researchers encouraged school nutrition professionals to focus on enhancing the food's appeal, offering foods students are familiar with, gaining student input and buy-in through focus groups, and providing superb customer service using friendly attitudes and positive communication (Castillo & Lofton, 2012). These authors also noted that common themes of satisfaction centered on the food's appearance and taste, as well as the service provided and deduced that improving these areas could lead to increased participation and satisfaction among students (Castillo & Lofton, 2012).

The two studies that created and validated survey for middle school and high school participants and non-participants, serve as a tool for school nutrition professionals in any district to gather data as a benchmark or for continuous improvement (Asperin, Nettles, & Carr, 2010). In developing those surveys, authors took advice from school nutrition professionals in adding a demographic question to determine if the student was a non-participant or participant and thus, appropriateness for the survey. In the first survey development, authors suggested a guide be developed to aid school nutrition staff in planning, administering and interpreting this survey. In addition, as a follow up to the study, a best practice list was recommended to assist school nutrition professionals in improving their programs to increase participation. To date, a survey guide is readily available.

Research regarding student perception of and participation in school lunches is important to study. Gathering consumer feedback can aid school districts in proactively improving the food offerings in their meal programs to reach more students with a

variety of nutritious and balanced meals that are flavorful and appealing. Improvements to food's flavor, appearance and variety, as well as positive customer service interactions with foodservice staff, may increase student satisfaction and participation in the NSLP, yielding a positive brand and increased revenue. Continuous quality research should be conducted in school settings as students' expectations of foodservice and preferences change as they get older and become sophisticated adults, and societal cultures change.

Parents and adults have a vital role in teaching and modeling healthy behaviors to students. Furthermore, these key stakeholders can be advocates of school nutrition programs, and promote the goals of the NSLP. School Food Authorities can benefit from partnering with parents and adults in the community to gain information, identify opportunities to educate both students and the public, and promote changes to NSLP and simultaneously encouraging students to participate.

In identifying factors that influence school lunch participation and making deliberate changes to the nutrition program, school nutrition staff can utilize student input to make improvements in the program, which could in turn encourage more students to participate and increase satisfaction, ultimately increasing revenue from reimbursement and improved customer satisfaction.

CHAPTER 3: METHODS

Previous research has shown a decrease in school meal participation among middle and high school students, compared to their elementary peers. This may be partially due to the fact that as students age, they become more independent.

To understand the factors that impact student participation and satisfaction of school meals, a questionnaire was modified to assess whether or not students eat meals at school, and their opinion on the quality, flavor, service, and convenience of school meals.

The purpose of this study was to understand High School students' perceptions of school lunch program, identify areas of improvement to school lunch program, identify areas of the district's lunch offerings with lowest and highest student ratings, and provide a foundation for the Food Service department's continuous improvement plans. This research will be conducted after the changes to the meal program went into effect, in compliance with the HHFKA regulations.

Subjects

Four high schools in the district were selected to participate in this study. [REDACTED]
[REDACTED]. Students at another high school, [REDACTED], were not included in this study as the lunch meals offered at that school are different than the high schools selected. The high schools selected offer the same meats, cheeses, and grain items on the sub-sandwich station and taco stations daily. In addition, two entrees are offered daily, which changes from day to day. Entrees can be home-cooked such as lasagna or sandwich or pizza

entrees. Lastly, all schools have a salad bar that includes a small variety of fresh, canned, and dried fruits, as well as a wide assortment of fresh vegetables. High school students were chosen because the high schools operate an "open campus" during lunch, where students are allowed to go off site during the lunch period.

Based on the ICN's survey guide, a minimum of 330 surveys from school lunch non-participants and 352 surveys from school lunch participants were suggested for an adequate sample size; therefore, survey completion from our target population was approximately 700 students.

Study Protocol

The district administration approved the study in April 2016, and Mount Mary University Institutional Review Board approved the research in June 2016 and determined it was exempt from full review through specific procedures as it utilized a survey with no identifying information. A representative from ICN gave permission for use of the surveys and to modify the survey by using certain statements and sections. The questionnaire was developed using statements from the ICN surveys that were of most interest to the district research department staff assisted in modifying the questionnaire to include pertinent statements. One student volunteer was asked to take the survey as a pilot test. The particular student did not eat school lunch due to the noise level in the cafeteria and the amount of food. Therefore, an option of "the amount of food filled me up" was added as an available reason for nonparticipants to choose school lunch. The district research department assisted in creating the survey in an online platform, Survey Monkey. The primary researcher then tested the survey to

ensure logic was appropriate and questions were flowing accurately. With assistance from the district's Department of Technology, email groups were created to include all enrolled students at each of the four schools.

Each school principal and main office secretary was asked to include the Notice to Parents (Appendix A) in their respective Fall newsletters, and the notice was also posted on the district's Food Service website. A week prior to the survey start date, the advisor for student council groups was asked to have students promote the survey as a means for their peers to voice their opinions. The survey was also promoted to all district staff members the Friday before, and the Friday during survey week, in the district-wide weekly Staff [REDACTED] Newsletter. Also, a promotional flyer was sent to the Head Cooks at each school to post near the cashiering stations during the week of the survey. A short message about the survey was requested to be included in morning announcements at each of the schools during the survey week. Lastly, brief promotional messages about the survey were shared on the district's Facebook and Twitter accounts multiple days during the week of survey administration.

Questionnaire tool

The survey questionnaire tool was modified from two validated surveys that were created by ICN researchers (Asperin, Nettles, & Carr, 2010) for gathering student input of school meal programs (Appendices C & D). Statements from the ICN "High School Student Satisfaction Survey" and "Non-Participation Survey", were reviewed by the primary researcher and selected and modified based on relevancy to our population and areas that could be influenced directly by the food service department.

One question on the survey was used to identify whether students were participants or non-participants in the school lunch program. Students were asked how frequently they participate in school lunch during the week. Students who responded that they consumed school lunch zero times per week were considered non-participants while those that reported consuming school lunch one or more times per week were considered participants in the school lunch program.

For students that were identified as 'participants' of eating school meals, the questionnaire queried different aspects of the program, similar to the ICN participant surveys. These questions focused on the food's quality, service, and convenience, with a Likert scale of 1 to 5 stars to measure student's level of agreement. Lastly, the students eating school lunch were asked if they would like to eat off campus and if so, where and what food they would get.

For students identified as 'non-participants', the questionnaire asked these students whether they did or did not eat during the lunch period, as well as location and what foods were consumed. Non-participating students were also asked to recall the last time they ate school lunch. Lastly, students were asked to select improvements that would influence them to eat school lunch, with an option being "no matter what, I won't eat school lunch".

The original ICN "Non-Participation Survey" worded all questions and statements in the negative. We felt the need to change questions and statements to the positive because we felt it was a best practice method in designing a questionnaire for this research. An example of this is: "the amount of food is inadequate" in the ICN's study was changed to "the meal fills me up". Some topics, such as the friendliness of the staff

(customer service) and the taste of the food, appeared on the surveys for both participants and non-participants alike. In addition, all questions were required except those that included an open text box, which was asked if the student chose the lowest rating of Strongly Disagree to certain questions. Lastly, students were allowed to choose only one answer, with the exception of questions 11 and 31 where multiple answers could be selected (Appendix E).

In the last part of the survey, included questions that were in addition to the original ICN's questionnaire. All students were asked if they are interested in local foods, vegetarian entrees, ethnic cuisine, and/or restaurant style meals. Lastly, there was an open text box available for ideas for new entrée items from topics selected in the previous question.

The modified survey used in this research was then entered into the online Survey Monkey platform, in order to send the survey to students electronically and collect responses.

Data Collection

All students at the selected high schools were sent a personalized link to the survey electronically via their student email accounts on the morning of Monday, October 3, 2016. A reminder email was sent to students four days later (Friday, October 7) and the survey response window was closed that night at 11:59 pm.

School demographics of student enrollment, free and reduced eligibility, and average daily participation in school lunch were collected from the student information

system (Infinite Campus) for each of the selected schools during the week of survey administration. Student specific ethnicity and meal eligibility were not collected.

Data Analysis

Data from the completed surveys were exported into Excel from the online Survey Monkey platform, and responses were coded following the methods suggested from the "Tabulating and Interpreting Results" section of the ICN guide to administering the survey. A response of "strongly agree" was coded 5, "agree" was given a 4, "neutral" was 3, "disagree" was 2, and "strongly disagree" was 1. Survey Monkey reported number of responses and percentages by answer selected for each question. For questions with that were skipped, the Survey Monkey tool reported the number of total responses and the number of survey respondents that skipped the question, either due to choice or logic built into the survey.

Responses from students who agree to the study and answer question 6 regarding frequency of eating school meals will be included in data analysis. Furthermore, student responses taking over 1 hour to complete the survey will be excluded only from determining average time spent taking the survey.

One issue did arise with the flow of the survey. One student's responses were recorded for questions meant for the non-school lunch participants and the school lunch participants. In looking at that individual student's response to the frequency of eating school lunch, the student chose 4 days per week. Therefore, the student's responses for the non-participant questions were removed from analysis, but the answers for the participant's questions were kept for analysis.

Descriptive statistics including means, frequencies and percentages were reported with regards to each question in the survey. In addition, themes were identified for responses submitted within the open-textboxes. Lastly, independent t-tests were used to compare average ratings of satisfaction amongst the school lunch participants. An alpha level of 0.05 was used to test for significance.

CHAPTER 4: RESULTS

General demographics

Enrolled students at the four participating high schools and their school meal participation rates were collected via Infinite Campus student information system. Student enrollment averaged 5,487 students per day over the week of the study. Of these students, 2,664 (48%) were eligible for free meals, and 370 (7%) had a reduced eligibility status, leaving 2,453 (45%) with a paid eligibility status. During the study week, the average daily participation of enrolled students eating school lunch was 42%, with an average of 54% of free eligibility students participating in school lunch.

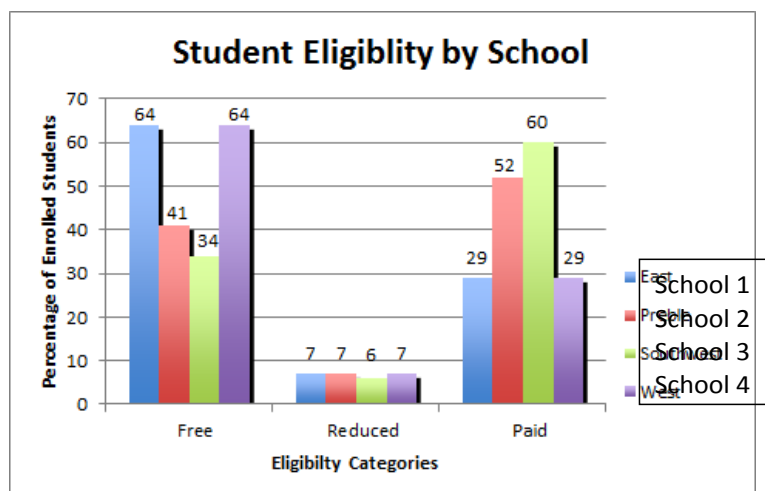
Each school varied in its enrollment, percentage of students with free, reduced and paid eligibility statuses, and average daily participation in school meals. Table 1 shows each school's demographic information. The enrollment of the four high schools varied from 837 to 2,218 students. The percentage of students with free, reduced and paid eligibilities varied considerably across schools, with 34% to 64% of students receiving free meals, and 39% to 60% having to pay full price for school meals. Oftentimes, the free and reduced percentage is reported as a total of the combined groups. Amongst all schools in this study, the free and reduced percentage ranged from 48% to 71%. Figure 1 below showcases the differences in meal eligibility between the four schools in this study. The average daily participation, or average of all enrolled students eating school lunch varied from 33% to 53% of students within the selected schools. Within each of the eligibility categories, however, the average daily

participation among students was more similar. Around half (49% to 59%) of the students receiving free meal benefits participated in school lunch, as well as 43% to 63% of students with reduced price lunches, and 23% to 37% of students with a paid meal eligibility.

Table 1. School Enrollment and Lunch Reimbursement Characteristics

	School 1	School 2	School 3	School 4
Total Student enrollment, N (%)	1,312 (24)	2,218 (40)	1,120 (20)	837 (15)
Daily School Participation, N (%)	591 (45)	906 (41)	367 (33)	444 (53)
Free	446 (53)	490 (54)	183 (49)	315 (59)
Reduced	39 (44)	76 (51)	29 (43)	39 (63)
Paid	106 (28)	340 (30)	155 (23)	90 (37)

Figure 1. Comparison of Meal Eligibility across schools



Study Sample

During the study duration, the survey link was accessed by a total of 1,309 students. Of those, 1,292 (98.7%) agreed to take the survey and continued. Question 6 on the survey asked about frequency of school meals; those students that answered that question ($n = 1,184$ (90%)), moved on to complete the rest of the survey. Survey response based on enrollment shows that 22% of enrolled students participated in this study as school lunch participants and school lunch non-participants.

The majority of students responding to the survey were sophomores, juniors, and seniors (26%, 31%, and 33% respectively). Completion of the survey varied by school. Nearly half of respondents (48%) were from ██████ High School 2, followed by 23% from ██████ High School 1, 16% from ██████ High School 3, and 13% from ██████ High School 4. The majority of survey participants were female (691, 58%), and few participants (64, 6%) preferred not to disclose. Characteristics of students responding to the survey is shown in Table 2.

For those students agreeing to take the survey and who reported the frequency of school meals consumed, the average time it took students to complete the survey was 6 minutes and 23 seconds, after 20 student responses were excluded as outliers due to taking more than one hour to complete the survey.

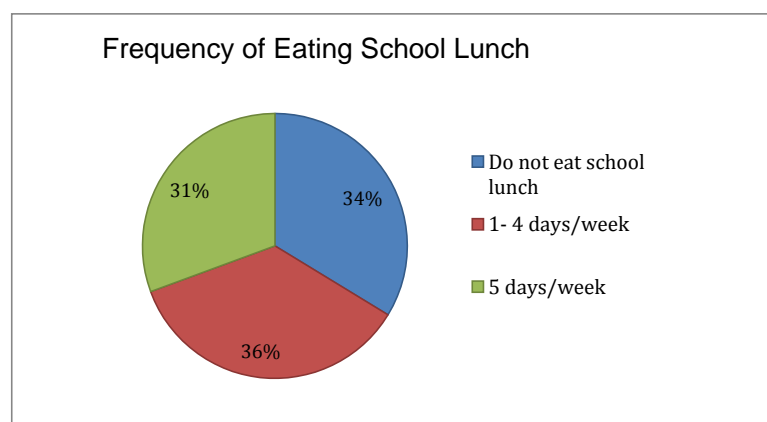
Table 2. Student demographics by participants and non-participants (N=1,184)

	Combined n (%)	Participants n (%)	Non-Participants n (%)
Schools			
School 1	266 (23)	187 (70)	79 (30)
School 2	565 (48)	360 (64)	205 (36)
School 3	194 (16)	116 (60)	78 (40)
School 4	159 (13)	122 (77)	37 (23)
Grade			
Freshman	116 (10)	97 (84)	19 (16)
Sophomore	310 (26)	243 (78)	67 (22)
Junior	364 (31)	245 (67)	119 (33)
Senior	394 (33)	200 (51)	194 (49)
Gender			
Female	691 (58)	436 (63)	255 (37)
Male	429 (36)	302 (70)	127 (30)
Prefer not to disclose	64 (6)	47 (73)	17 (27)

The main focus of this research was to understand student participation; therefore, participation was defined in the questionnaire using questions about frequency of eating school lunch. In those students responding to this study, 34% of students reported that they do not participate in school lunch at all, 8% participate once a week and twice a week, and 10% participate three and four days of the week. Lastly, 30% of students surveyed eat school lunch every day. Overall, about a third of the survey respondents participate in school meals daily, roughly another third eat school

lunch 1 to 4 times per week, and the last third don't eat school lunch at all. The diagram below (figure 2) demonstrates the distribution of students by frequency of consuming school lunch.

Figure 2. Students and their frequency of eating school lunch



School Lunch Participants

In this study, 31% (n=362) students ate school lunch every day and another 36% of students ate one to four times per week. For these students reporting participation in school meals, a series of questions were asked for them to rate the school lunch program. On a 5-star scale, the questions students rated the highest were (mean \pm SD): "service is friendly" (3.92 \pm 0.96), "enough time to eat lunch" (3.96 \pm 1.08), and "can spend time with my friends for lunch" (4.09 \pm 0.98). In contrast, participants rated the areas of the "food is appealing" (2.42 \pm 1.03), "the food has a homemade quality" (2.07 \pm 1.01), "the meal fills me up" (2.39 \pm 1.12), and "I would recommend my friends to get

school lunch" (2.21 ± 1.02), as lowest among all areas of the lunch program (mean \pm SD). Participants' level of satisfaction within all areas of the school lunch program is further illustrated in Table 3 below.

Table 3: School lunch participants rating different aspects of the school lunch program

Question/ Statement	Number of responses	Mean (Standard Deviation)
I can spend time with my friends during lunch.	732	4.09 (0.98)
I have enough time to eat my lunch.	734	3.96 (1.08)
The service is friendly.	748	3.92 (0.96)
Overall the service is good.	724	3.47 (0.93)
The serving and dining area is clean.	724	3.14 (1.05)
Picking up my meal is fast and convenient.	729	2.96 (1.09)
There are a variety of food items that I can select.	779	2.91 (1.00)
There is enough available, the menu item I want does not run out during the lunch period.	736	2.89 (1.00)
There is a variety in the menu from day-to-day.	742	2.80 (1.00)
I know what is on the menu before I get to the cafeteria.	736	2.62 (1.25)
Overall the quality of the food is good (taste, appearance, temperature).	721	2.54 (1.04)
The food is appealing (healthy choices, flavor is fresh, smells good, correct temperature).	770	2.42 (1.03)
The meal fills me up.	725	2.39 (1.12)
I would recommend my friends to get their lunch from the school cafeteria.	721	2.21 (1.02)
The food has a "homemade" quality.	749	2.07 (1.01)

In depth analysis targeted participants who choose school lunch 1 to 4 days per week compared to students eating every day, and their ratings of the school lunch program. In nearly all areas of the lunch program, the students who ate daily reported higher levels of agreement, and thus satisfaction of the school lunch program than their peers who ate less frequently. Analysis revealed that the following attributes of the school lunch program were statistically significantly different between daily participants to their peers who participate less often: variety of food items, food's appeal, homemade quality, picking up meals is fast and convenient, and overall quality is good ($p < 0.001$). In addition, the students participating daily rated the "service is friendly", "day-to-day variety", and "overall service is good" significantly higher than students eating 1 to 4 days per week ($p < 0.01$). Lastly, the average ratings of "there is enough available of the menu item" and "have enough time to eat lunch" were also statistically significant between every day participants and students who ate sometimes ($p < 0.05$). Table 4 below shows the attributes of the school lunch program and how everyday participants rated those areas, compared to students eating school lunch 1 to 4 days per week.

Table 4: Ratings of School Lunch Program by Categories of Participants

Statement	Participants who eat 5 days/week Mean (Standard Deviation)	Participants who eat 1-4 days/week Mean (Standard Deviation)	p- value
I can spend time with my friends during lunch.	4.11 (1.02)	4.07 (0.95)	0.56529
I have enough time to eat my lunch.	4.05 (1.11)	3.88 (1.06)	0.02806
The service is friendly.	4.02 (0.96)	3.83 (0.95)	0.00629
Overall the service is good.	3.57 (0.94)	3.38 (0.92)	0.00625
The serving and dining area is clean.	3.15 (1.05)	3.12 (1.05)	0.69814
Picking up my meal is fast and convenient.	3.13 (1.11)	2.82 (1.06)	0.00012
There are a variety of food items that I can select.	3.04 (1.01)	2.80 (0.98)	0.00089
There is enough available, the menu item I want does not run out during the lunch period.	3.00 (1.10)	2.79 (1.16)	0.01258
There is a variety in the menu from day-to-day.	2.92 (1.03)	2.70 (0.96)	0.00311
I know what is on the menu before I get to the cafeteria.	2.63 (1.29)	2.62 (1.23)	0.94559
Overall the quality of the food is good (taste, appearance, temperature).	2.72 (1.07)	2.39 (0.99)	0.00002
The food is appealing (healthy choices, flavor is fresh, smells good, correct temperature).	2.59 (1.08)	2.27 (0.96)	0.00002
The meal fills me up.	2.52 (1.16)	2.29 (1.08)	0.00817
I would recommend my friends to get their lunch from the school cafeteria.	2.45 (1.12)	2.01 (0.89)	0.000000008
The food has a "homemade" quality.	2.21 (1.06)	1.94 (0.95)	0.00019

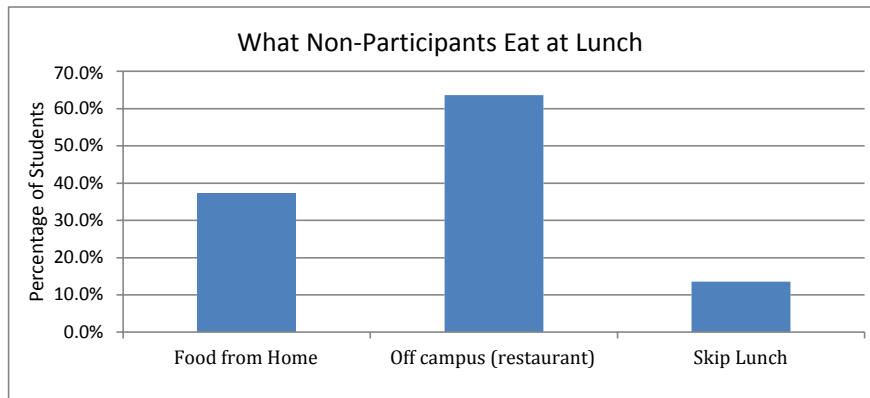
The students who participated in school lunch were also asked if they'd prefer to eat off campus. Of the 719 students that responded, 66% of them answered yes, a mere 6% responded no, and 28% of students replied that they already do eat off campus. Furthermore, for the students who want to or already eat off campus, they

were asked where they go, or would they like to go to eat off campus. The responses were grouped into the following themes: sit-down restaurant, fast food with drive through windows, ethnic cuisine (Asian, Mexican, Chinese, Korean), pizza, and other places such as the mall, grocery store, a nearby hospital cafeteria, and home or a friend's house. Of the different destinations identified, 353 responses were of fast food establishments, 229 noted sit-down restaurants, and 166 described other places. Overwhelmingly, 70% of the other places identified were home or a friend's house.

School Lunch Non-Participants

Of the non-participants, or students who do not eat school lunch, the majority of students responding to this survey were female (64%) compared to 32% of males. In addition, older students were the largest group of non-participants. Among the non-participants in this study, 49% were seniors, 30% were juniors, 17% were sophomores, and 5% were freshman. The majority of nonparticipants, 85% (n=339), do eat something during the lunch period. Of those non-participants that eat something during the lunch period, 37% (n=148) eat food from home and the other 63% eat off campus at a restaurant. The diagram (Figure 3) below shows the places the non-participants get their food for during lunch, if they eat during the lunch time.

Figure 3. Places non-participants get food, if eating during the lunch time



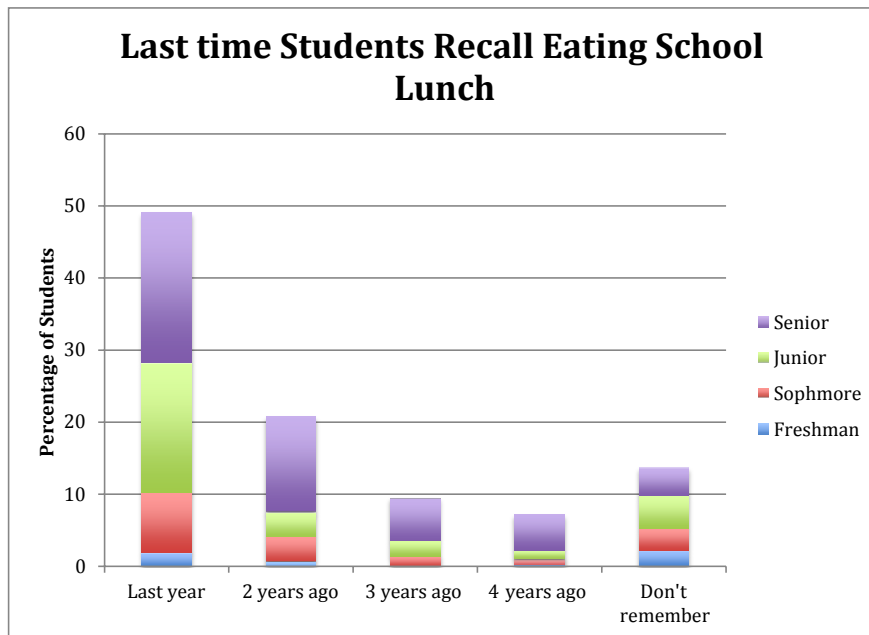
Further analysis examined the students that eat off campus at a restaurant. 53% of these students were from [redacted] School 2, 22% from [redacted] School 3, 20% of students from [redacted] School 1, and only 4% from [redacted] School 4.

Most of the non-participating students had consumed school lunch within the last year, as 49% of current non-participants reported eating a school lunch during the previous school year. Those students that reported eating a school lunch two, three, and four years ago were 21%, 9%, 7% respectively and the rest (14%) didn't remember the last time they ate a school lunch. No students chose the option during middle school or during elementary school as the last time they ate a school lunch.

Further investigation was conducted to see the last time students recall eating a school lunch to gauge how far removed the nonparticipants were from the school lunch experience. Surprisingly, the majority of students, as shown by 42% of seniors, 62 % of juniors, 48% of sophomores and 39% of freshman, remember eating school lunch during the last school year. The percentages of students by grade that remember eating

school lunch 2 or more years ago dramatically decreases from there. The highest percentages of students from each grade ate a school lunch during the last school year, whereas less students reported eating school lunch in previous years. The diagram (Figure 4) below shows the last time non-participants reported eating a school lunch, with students distinguished by grade.

Figure 4. The last time non-participants recall eating school lunch, by grade



When non-participants were asked to select what improvements would influence them to choose school lunch, specific qualities of the food such as taste, appearance, and meals similar to off campus as well as day to day variety, and the meal filled me up were commonly identified. The taste of the food was the highest influencer as 64% of

students identified it as an improvement that would persuade them to eat school lunch. Following that, menu items similar to those off campus, appearance of the food, more day to day variety, and amount of food filled me up were the next highest influencers, with roughly the same amount of weight, chosen by 43%, 46%, 44%, and 43% of students, respectively. Only 18% of non-participants reported that they would not eat school lunch regardless of what improvements were made to the program.

Numerous statements that were available for non-participants choose as improvements that would influence them to eat school lunch were those not commonly selected. The lowest influencers were the menu item didn't run out, time to spend with friends, friendly foodservice staff, enough time to eat, and food available outside of lunch hours. This shows that even amongst the non-participants, the lowest rated influencers are not deterring them from choosing school lunch. The improvements that would influence nonparticipants to choose school lunch are shown in Table 5.

Further investigation was conducted among students who reported eating the year before. Generally, the influencers that were reported from all non-participants were also those reported highest and lowest among those who ate school lunch during the last year. However, in comparing the influencers reported by students who ate during the last year versus students eating 2, 3 or 4 years ago, the influencer of improved taste was the most different between the two groups. For students who ate last year, 56% of them reported that improved taste would influence them to try school lunch, compared to 77% of students who ate school lunch more than a year ago. This difference could be a difference in perception of the school meal program by those who are farther removed from the school lunch experience.

Table 5: Influencers for Non-Participants to eat school lunch

Influencer	Combined n (%)	Students who ate Last Year n (%)	Students who ate 2,3, or 4 years ago n (%)
Improved taste	226 (64)	225 (56)	105 (77)
Food had better appearance	162 (46)	161 (40)	63 (46)
More variety day to day	155 (44)	155 (39)	60 (44)
Amount of food filled me up	152 (43)	151 (38)	46 (34)
Menu items similar to those off campus	150 (43)	150 (38)	45 (33)
Take out (grab n go) meals available	111 (32)	111 (28)	45 (33)
Food had appropriate temperature	100 (28)	100 (25)	33 (24)
Healthier food	91 (26)	89 (22)	41 (30)
Shorter Wait in Line	88 (25)	87 (22)	29 (21)
Knew what was on the menu	79 (23)	79 (20)	29 (21)
Clean serving & dining area	71 (20)	71 (18)	27 (20)
Does not matter	63 (18)	62 (16)	31 (23)
Food available all day	56 (16)	56 (14)	17 (12)
Menu item didn't run out	53 (15)	52 (13)	17 (12)
Enough time to eat	37 (11)	37 (9)	13 (9)
Friendlier staff	35 (10)	34 (9)	17 (12)
Time with friends	23 (7)	23 (6)	9 (7)

Students' Interest in other Entrees

All respondents of the survey, regardless of whether or not they ate school lunch, were asked about what types of foods and specific entrees they would be interested in. Of the available choices, 19% of students were interested in vegetarian entrees, 59% wanted local foods, 35% of students chose traditional ethnic cuisine, 60% were interested in fine dining or restaurant meals and only 8% were not interested in adding entrees to the lunch menu. Here, students were also able to enter free text into a comment box. The most popular themes from the comments were pizza, especially from a pizza restaurant, grilled cheese, soup, better fruits and vegetables, fish, vegan

and vegetarian items, and pasta dishes. Also commonly shared were sides such as fries as cheese curds, prepackaged salads and entrees, seasonings and products to enhance the food's appeal, peanut butter and jelly sandwiches, and chicken tenders.

When prompted further for specific entrees in the next question, numerous categories of food arose, similar to the question before. These categories included pizza, fish, pasta dishes, and fruits and vegetables. Also often described were foods of ethnic cuisine, burgers, sides such as fries and cheese curds, prepackaged salads, and chicken tenders. There were similar themes identified in the areas of interest and ideas for new entrees that students shared.

CHAPTER 5: DISCUSSION

Student response rate was 22% of enrolled students. Considering participation was voluntary and was a convenience sample, participation was adequate representation of the four high schools. Among the four high schools, students from [REDACTED] School 2 who replied to the survey were the largest group of contributors to this study. This may be due to the fact that [REDACTED] School 2 has the highest enrollment among the four selected schools as well. Another reason more representation was from [REDACTED] School 2 could be explained by the marketing strategies and staff involvement. The schools' September newsletter included a short message about the study with the link to the study's Notice to Parents. In addition, one teacher in that school promoted the survey as part of her advisory role to a student council group, and also promoted it to her class and allowed them to respond to the survey during her class time, as it fit well into the teacher's current lesson plan. When considering the grade level of students, the freshman class was under-represented. However, this group of students has the least exposure to the high school lunch environment and opportunities to go off campus, compared to the other grades, even though the middle school menu is similar.

With regards to student meal price eligibility, two of the schools had lower free and reduced percentages, and thus a larger population of students with paid meal eligibilities compared to the other two schools. Both [REDACTED] School 3 and [REDACTED] School 2 had the lowest percentage of enrolled students receiving free meals and the highest percentages of students with paid meal eligibilities compared [REDACTED] School 1 and [REDACTED] School 4. Overall, there was a diverse blend of students from the selected schools

in this study, with regard to free and reduced eligibility status. Furthermore, similar to other studies, a larger percentage of students with free or reduced eligibility participated in school lunch more often than their peers with paid meal eligibilities. From the schools in this study, 49% to 59% students with free eligibility and 43% to 63% students with reduced eligibility ate school lunch more often, compared to 28 to 37% students paying full price for school lunch. It is interesting to note that among the schools in this study, School 4 had the highest percentages of students from each of the eligibility categories participating in school lunches.

Key Findings from School Lunch Participants

In this study, the areas of the school lunch program that participants agreed with most were “service is friendly”, “have enough time to eat”, and “can spend time with my friends”. The level of participants' agreement in these areas is evidence that students are satisfied with the customer service of school nutrition staff and length of lunch periods. In contrast, participants rated the areas of the “food is appealing”, “the food has a homemade quality”, “the meal fills me up”, and “I would recommend my friends to get school lunch” as lowest among all areas of the lunch program. All participant responses were kept in the data analysis to understand the reality of the state of the school lunch program. There were a total of 9 participants who were very dissatisfied, selecting the lowest rating (strongly disagree) to 12 or more of the 15 statements, which may have slightly impacted the level of satisfaction in those statements.

When analyzing responses from participants who eat 1 to 4 days compared to students eating every day, there was a significant difference in the level of satisfaction among many of the statements. This means there is a difference in perception of school meals between these two groups of students. This difference in perception could impact why the sometimes eaters don't participate every day, or why the students that eat 5 days a week do participate daily. In this study, we cannot determine which factor (student participation or perception of school meals) drives the other.

Different from other research, this study focused on the participants' satisfaction of the current state of the school lunch program. Previous studies by Asperin, Nettles, and Carr (2010) was attentive to determining factors of why students participated in school lunch. Those researchers found that food quality, choices, portion sizes and foods available to students influenced students to participate. Castillo and Lofton (2012) identified two factors that influenced middle school participants to choose school lunch as concepts related to both the food itself, including variety and healthfulness of choices, as well as the social experience of eating lunch with peers. Although this study and previous research were dissimilar in study population and its objectives, similar themes were identified among students when asked about school meal satisfaction. Food quality and variety were two qualities of school meals that have been consistently shown to contribute to school meal satisfaction. In this study, non-participants strongly supported improved food flavor and more day-to-day variety as a means to try school lunch, and the same topics were among the lowest ratings as reported by school lunch participants. This provides strong support for school district improvements to the food

quality and variety to increase student satisfaction, which could lead to participants choosing school lunch more often.

When all school lunch participants were asked about eating off campus, nearly all of them either would prefer to eat off campus, or already do eat off campus. Of those, two-thirds of them responded that they would choose to do so if they could . It is unknown the reasons why students choose not to go off campus, but cost or transportation could be potential factors. Some students may be eating school lunch even though they prefer to go off campus, but may not have access to a vehicle or have funds to pay for meals. Students report that they already eat off campus or would like to at the following places: fast food restaurants, ethnic establishments, pizza places and other destinations. These places offer a different dining experience, such as grab 'n go, as well as different flavors in traditional ethnic cuisine and student friendly foods, such as pizza and burgers. In addition, the majority of students who prefer to go to other destinations often described a friend's house or their home, invoking that the social aspect and feeling of comfort or independence is important during their lunchtime .

Key Findings from the Non-Participating Students

Most of the non-participating students reported consuming food during the lunch period, mainly off campus at a restaurant. It is likely that the students eating off campus are those from schools with high percentages of students paying full prices for meals, or possibly in areas heavily populated with nearby restaurants. Just over half of the

students that reported eating off campus at a restaurant were from [REDACTED] School 2, which has the second highest percentage of students with a paid meal eligibility status. Due to the cross-sectional nature of the study, cause and effect cannot be determined, but it may be inferred that student eligibility is in some way, connected to students choosing to eat off campus. Many non-participants recalled eating a school lunch during the last year, which is optimistic for foodservice administration. Making some purposeful and well marketed changes to the school lunch program will likely influence these students to try school lunch again, as they are not too far removed from the school lunch experience. Many students from each grade recalled eating a school lunch during the last year. This is hopeful that although participation in school lunch may decrease as students get older, some juniors and seniors did eat school lunch the year prior. However, it is unknown from this study the impact of a driver's license and a vehicle has to students participating in school meal programs. It is possible that some seniors may recall eating lunch during their junior year before having the means to leave campus with a vehicle.

Interestingly, a small percentage of non-participants decided they would continue not eating school lunches regardless of what areas of the program were improved. This is optimistic as it invokes the assumption that the other 82% of non-participants in this study would be willing to try school lunches again if some improvements were made to the food qualities and choices. Therefore, it is important for school food services to focus on methods to capture the students willing to try school lunches if improvements were made.

To entice non-participants to choose school lunch, a few key areas stood out as most influential by these students. By far, the improvement that got the most votes was improving the food's flavor. Following that, having menu items similar to those off campus, more variety in the foods served day to day, improving the food's appearance and the amount of food to satisfy students were selected as changes that would sway students to choose school lunch. The findings in this study are consistent with those found by other researchers. Castillo and Lofton (2012) found the non-participating middle school students wanted better tasting and better quality food, as well as more food choices. Similarly, in 2010, researchers found that high school students wanted improved food quality and more variety from day to day (Asperin, Nettles & Carr). A large percent of students in the Cincinnati Public Schools also agreed that they would consider eating school lunch if the quality of the meals was improved (Marples & Spillman, 1995). Lastly, students in the nationwide School Nutrition Dietary Assessment study described that they were only sometimes or never satisfied with the flavor, appearance, and aroma of the food (Gordon et al., 2007). The findings from this study align with other research and shows that a high level of student participation and satisfaction weighs on the food itself- its flavor, smell, appeal, and variety.

Nearly all of these improvements identified by non-participants in this study are factors of the food itself. Furthermore, factors such as friendliness of staff and time to eat and spend with friends were the chosen less often as improvements that would encourage these students to choose school lunch. Contrary to the findings of Asperin, Nettles, & Carr in 2010, who found that interaction with school nutrition staff was a common reason students didn't participate, only a small percentage of students

in this study noted staff friendliness as an influencer to eat school lunch. In a sense, customer service and duration of lunch periods are strengths of the program and are not reasons that non-participants don't choose school lunch in the district.

A Comparison of the Non-Participants and the Participants

Many of the areas identified in this study by non-participants as changes that would influence them to eat were also analogous to areas the participants rated as the lowest of satisfaction. Overwhelmingly, the specific qualities of the food such as its taste and flavor, as well as the amount of food were noted by both groups of students. This shows that participants are not satisfied with the food's appeal or amount of food and non-participants would consider eating school lunch if the taste was improved and bigger portions were available. In addition, participants disagreed that that food was homemade and a large number of non-participants noted day-to-day variety as a factor in choosing school lunch. Anchorage School District recently overhauled their menu to improve the food's taste, nutritional value, or overall quality. Of note, the food service department added region specific foods, new homemade bakery items, and is tying food to events such as Hobbit Stew, connected to a historic novel by J.R.R. Tolkien. Prior to changing the menu, the Student Nutrition Food and Menu Manager collected "handfuls of complaints", compared to "consistently receiving positive emails" after implementing the changes. Improving food's taste and quality and adding new student approved products can increase student satisfaction and participation.

Along the same lines, participants were satisfied with staff friendliness and time to eat and spend with friends, and at the same time, very few non-participants cited these attributes as influencers to eat. This means that there is no alarming need to change duration of lunch periods, and that students enjoy the social experience of spending time with friends during lunch.

In regards to the students' ideas for new entrees, both prepackaged salads and ethnic foods were described. Many districts nationwide offer these popular food items, as Mexican and Asian foods along with prepackaged salads and salad bars were commonly offered in schools, as cited by numerous respondents in the recent School Nutrition Operations Report, respectively (School Nutrition Association, 2016).

Future Research

Future research in the area of school nutrition should continue to focus on meeting the needs of the customers (the students). As many studies suggest, starting with a focus group to identify customer's needs is important. Creating questions that are straightforward and that determine if students would change their behaviors and choose school lunch if a certain change was made is essential to identifying what changes are worthwhile investments. Also, research including the effect the cost and free, reduced, or paid eligibility has on the student's choice of whether or not to participate in school meals would be important to study, as student specific eligibility was not collected in this study. Having a pilot of different methods of delivering school meal service to students could be helpful in identify what new routes or methods to

pursue. Lastly, studying the differences of elementary and middle school students may be helpful to gauge the factors that influence school lunch and how that progresses through the lifespan in meeting customers' needs.

In addition to continued research with students, studies including parent and adult perception would be worthwhile. Parents and adults play an important role in the lives of students. Oftentimes, adults significantly influence and role models opinions to their children and students they spend time with. Identifying parent perceptions of the school meal program and educating parents can build support for the school lunch program. With the support of adults, these key stakeholders can promote the school lunch program to students. Adults and parents that understand and support the school lunch program can assist in influencing students to participate in school meals.

Lastly, future long-term studies should focus on the nutritional benefits of students participating in the NSLP. As the major focus of the NSLP is to provide healthy meals to financially disadvantaged children, the nutritional status and disease risk of participating students can be measured to determine the extent that the NSLP is achieving its purpose. It is to be expected that the nutritional quality and disease risk of those eating school lunch would have better outcomes, as students are required to take one-half cup of fruit or vegetables as part of a lunch meal. In order to assess disease risk and quality of life, the studies would need to be conducted over a long-term time frame and measure indicators at multiple points in time. Studies showing the connection between students eating healthy school lunches, and quality of life indicators such as lowered risk of disease in adulthood, would be great evidence of how important and essential the NSLP is for children.

Strengths & Challenges

This study was the first of its kind to gauge the students' perception of the school lunch program in the district, since the enactment of HHFKA. The study has numerous strengths as well as some challenges and limitations. As participation in the survey was not required, a survey response of over 20% of enrolled students is a positive from a convenience sample. In addition, having a similar number of responses from groups of participants and non-participants was a strength of the study as it means that there were adequate groups to compare. The survey was well promoted to students and staff and was sent directly to their email accounts. Although numerous marketing strategies were employed, there was no control over the extent to which the survey was promoted within each school. Since the survey wasn't required for students as part of the school day, it cannot be generalized to all students, within or outside of the district. Also, since the study was done electronically and the user's http address wasn't tracked or limited, it is possible that multiple responses could have been generated from the same student taking the survey more than once. However, it is assumed that students only took the survey once because it was delivered to their individual email address that requires a secure login. In addition, the survey used self-reported data from the students, rather than hard data. Furthermore, this study does not include student specific eligibility data to see the role eligibility status plays in the student's choice to participate in school meals. In addition, this study had a large representation of students who ate daily. Although these students had similar ratings of the school lunch program,

it would be interesting to study the reasons as to why students participate in school lunch every day. Lastly, even if changes were to be made that were based on students' feedback, those changes do not guarantee increased participation, as other unidentified reasons could be impacting student participation in school lunch. For example, social stigma or the perception that school lunches are for students who don't have money could negatively impact students from choosing school lunch.

Conclusion

This study was the first of its kind to survey high school students to understand their perception and satisfaction of the school lunch program, with specific focus on their participation in the school lunch program. In this study, nearly equal groups of students participated in school lunch daily, participated in school lunch sometimes, or didn't participate at all.

Over half (63%) of nonparticipants reported eating lunch off campus at a restaurant. In addition, 49% of nonparticipants recall eating a school lunch last year, proving that they are not unfamiliar with the school lunch environment. Of all the nonparticipants that don't eat school lunch, 82% reported that they would consider eating school lunch again if certain improvements were made. The most common improvements these students selected were "the taste...was better", "menu items similar to off campus" were available, more day to day variety was offered, as well as improving the food's appearance and the amount of food included in the meal.

Somewhat similar to the areas identified by nonparticipants were the areas rated lowest by the students who ate school lunch. Participants rated “food is appealing”, “the food has a homemade quality”, “the meal fills me up”, and “I would recommend my friends to get school lunch” lowest among all areas of the program. Focusing on improvements in the identified areas from nonparticipants and participants can lead to increases in customer satisfaction and meal participation.

School Food Authorities have numerous challenges in providing meals to students that are widely accepted and fit within the meal pattern regulations while being fiscally responsible in balancing reimbursement revenues with expenses, such as food and labor cost. School nutrition professionals are especially invested and should continue studying their customer's needs and identify areas to focus efforts to expand meal participation. After making purposeful improvements, both in terms of food's quality, taste, appearance, and promoting those changes, school foodservice departments should continue to study the impact of those changes on student satisfaction and participation in school meals.

CHAPTER 6: IMPLICATIONS & RECOMMENDATIONS FOR THE DISTRICT'S FOOD SERVICE DEPARTMENT

The findings of this study can be very useful for implementing purposeful changes as part of continuous improvement. Overwhelmingly, students, both participants and non-participants, reported that the taste or flavor of the food needs to improve in order to choose school lunch more often. One suggestion would be to add flavor with spices and herbs. Around the same time as this study, the Food Service department added flavor stations at each middle and high school. These flavor stations contain multiple no-salt spices with flavors such as spicy jalapeno and southwest chipotle for students to add to their food. In addition, using and offering herb and fruit vinegar sprays such as oregano spray on herbs for Italian entrees and cranberry fruit vinegar sprays at salad bars is a way to enhance the flavor of food. Another way to identify what flavor students prefer is to do taste testing with new products, which is currently happening at the district. Student response to the survey shows that students are interested in voicing their opinions and desire to have input into their school lunch program. Organizing a food show where students could try and vote on numerous different foods, would be a great way to get all students involved in deciding what foods to purchase and have on the menu. For example, students at South Hagerstown High School in Washington County, Maryland participate in an annual school food show to try potential new menu items. The supervisor of Food and Nutrition Services in that district planned to see more than 200 people at the event (Greene, 2016). The food show included foods from numerous vendors, and was hosted in November, to allow time to

review the products, gather student feedback and plan to menu and procure the items. At the event, students were asked to rate the food's quality and the price they would be willing to pay for the item. At the event, which attracted parents and students; both students who participated in school meals and those that do not were interviewed (Greene, 2016). In addition, utilizing technology to collect student feedback and ratings of foods can be quick and convenient. One such program is NutriSlice™ software which publishes menus online. The program is a website or a phone app that allows the user to select a food on the menu and read the description, allergens it contains, and nutritional information, as well as gives the user the ability to rate the food on a five -star scale. This feedback is sent behind the scenes to the foodservice administration and is not made public on program's website or phone app. Taking student taste testing feedback into consideration when deciding what items to offer on the menu can prove to be a worthwhile investment, as it will likely influence more students to choose school lunch.

Non-participants of this study wanted more foods similar to what they can get off campus. The Food Service department should create new entrees by copying those found at nearby popular restaurants, such as the Buffalo Chicken Mac & Cheese at Noodles and Company® restaurant, or burrito bowls from Chipotle® restaurant. One of the entrees on the menu at the selected high schools is the Popcorn Chicken bowl. This entrée contains popcorn chicken, mashed potatoes, corn and gravy and is served with a dinner roll, and is similar to meals from KFC®. The Food Service department could also contract with restaurants that make school approved entrees, such as Smart Slice pizza or A+ pizza line from Domino's® or Pizza Hut®, and offer those items on the menu.

Non-participants also reported that more day-to-day variety would influence them to eat school lunch. Food Service should consider offering new entrees, perhaps 1 to 4 times per month, to keep the options changing, and to not overdo too much of a good (or new) thing. In addition, adding a new meat, cheese or grain options to the taco and sub sandwich stations and rotating that item to be offered every other week or seasonally would increase variety of offerings at those standard stations.

The lowest rated quality that student lunch participants rated was “food as homemade”.. An easy way to change that mindset is to educate students how the food is homemade. Sharing recipes of soups and muffins, as well as offering tours through the main production kitchen, and promoting the video of the kitchen, can aid in turning the perspective of home cooked foods around.

Both participants and non-participants noted a needed improvement in the food's appearance. Using retail-like equipment and signage in cafeterias, as well as black disposable plates for building a salad would boost the appearance of how the food is served. Participants and non-participants alike felt that the amount of food didn't fill them up. To combat this issue, low calorie sides such as steamed vegetables or chips could be offered with the main entrée, as long as the menu continues to be in compliance with the nutrient standards. Additionally, a meal with the entrée, sides and drink could be advertised as a meal deal emphasizing the amount of food and nutritional and price information, and could even go as far as comparing it as a more enticing option than meals from other food establishments.

Lastly, Food Service could lead the way in making changes to school lunch by offering food services that appeal to this population. Following the typical

cafeteria lunch line, Grab & Go kiosks are the next most common method of lunch service, as noted by 24% of districts nationwide (School Nutrition Association, 2016). Food Service could set up a Grab & Go station where the students enter and exit the building to bring the lunch where the students are and capture the school lunch non-participants. Lastly, having a food truck at popular parks and hangout areas, or creating a phone app to order a meal for pick up during the day between classes are other new and exciting ways of delivering food service.

All students at the end of the survey responded to what items they are interested in. Overwhelmingly, the large majority of students in this study identified local foods and fine dining or restaurant meals. Food Service should continue to pursue bringing in local foods and highlighting which items are local in the cafeteria and through marketing. In response to restaurant and fine dining foods, using retail-like equipment and realistic dinnerware can mimic a restaurant experience, as well as having name brand foods, like school approved Pizza Hut pizzas as described earlier. Using student feedback and the ideas described in this study to improve the school lunch program can reap positive rewards for the foodservice program and increase both student satisfaction and participation, generating more reimbursement revenue to fund further growth and enhancements.

With the suggestions and ideas for improving the food's flavor and appearance, as well as offering more variety and promoting the homemade quality and amount of food that comprises a meal, the district could increase student participation and reimbursement revenue. Because 82% of non-participants responded they would eat school meals if one of those qualities were improved, it is imperative that positive

changes be made. Additional reimbursement revenue would be generated if some of the non-participants and students already eating school lunch chose to eat school lunch 1 more day per week. In December, a brief summary of the survey results was shared with students and administration involved in the research (Appendix F).

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Appendix A: Notice to Parents Food Service Student Survey October 2016

Amy Zellner, t [REDACTED] is conducting a survey to learn about high school students' perception of the school lunch program and factors that influence them whether or not to consume school meals, and to fulfill a requirement of the Mount Mary University Masters of Science in Dietetics program. This survey will be emailed to your student in early October 2016, and help us to identify areas of improvement to the school lunch program, gain student input on new entrée ideas, and provide a foundation for continuous improvement plans.

Participation in the survey is completely voluntary and your student has the right to refuse to participate. Your student may refuse to answer any of the questions and may withdraw at any time without penalty, prejudice, or loss of benefits.

Your student's survey will be anonymous as there is no identifying code linking your student to the survey. All information from the completed survey will be kept confidential. Information from all the completed surveys will be reported in summary form only. There is no known risk to your student for participating in this study other than the time it takes to complete the survey. The survey results will be used by the foodservice department to identify areas of improvement in the lunch program, and by the researcher to complete a Master of Science in Dietetics degree. If desired, this study may be published after approval from the District.

If you have any questions about the survey, you may contact the researcher, Amy Zellner via email at [REDACTED] or by phone at [REDACTED], or the Mount Mary University Graduate Program Director, Tara LaRowe at larowet@mtmary.edu. If you have concerns about your student's privacy and rights, please contact Maureen Leonard, Mount Mary University IRB Chair at leonardm@mtmary.edu

Appendix B: Assent Statement

**Food Service Student Survey
October 2016
Assent for High School Students**

You have been chosen to answer a survey that will help us understand what you think of the school lunch program and the reasons why some students choose not to eat school lunches frequently. This survey is based on the previous research conducted by The Institute of Child Nutrition (formerly known as The National Food Service Management Institute).

Please complete the survey; it will take approximately 15 minutes. The first part asks you to indicate your grade level, favorite meal, gender, and how often you eat school lunches. The second part asks your opinion about the school lunch program or changes that could be made to improve school lunch. The last part of the survey asks about your interest in different entrees and ideas for new meals.

We encourage you to answer all the questions, because this will help us understand what is important to you. Please be honest, and keep in mind that there are no right or wrong answers. Your responses are anonymous, and there are no identifying codes linking you to the survey.

There is no known risk to you for participating in this study other than the time it takes to complete the survey. Participation in the survey is completely voluntary and you have the right to refuse to participate. If you decide to not complete the survey you may close the browser window at any time.

If you have any questions about the survey, you may contact the researcher, Amy Zellner via email at [REDACTED] or by phone at [REDACTED], or the Mount Mary University Graduate Program Director, Tara LaRowe at larowet@mtmary.edu. If you have concerns about your privacy and rights, please contact Maureen Leonard, Mount Mary University IRB Chair at leonardm@mtmary.edu

Thank you for providing us the feedback! Your input will help us improve the food service program to better meet your needs.

Appendix C: The School Lunch Experience Survey (Asperin, Nettles, & Carr, 2010)



The School Lunch Experience Survey

Making your opinions known

Completely fill in the circle of your answer. Use a #2 pencil.

Correct ●●● Use No. 2 Pencil Only Incorrect ✕ ● ✓

We want to know what you think! This survey is your chance to let us know how we're doing. Please take a few minutes to provide feedback on the quality of your dining experience at the school cafeteria.

SECTION I. Your lunch experience

Instructions:

Listed below are several features of school lunch programs. As you respond, use the phrase, "When I eat school lunches..." before each statement and then indicate your level of agreement by using the scale 5 (Strongly Agree) to 1 (Strongly Disagree).

When I eat school lunches...	Strongly Agree	5	4	3	2	1	Strongly Disagree
1. The food served is fresh.		5	4	3	2	1	
2. The staff understands my meal time needs.		5	4	3	2	1	
3. The food tastes good.		5	4	3	2	1	
4. There is a variety of food items that I can choose from.		5	4	3	2	1	
5. The food smells good.		5	4	3	2	1	
6. The menu provides healthy meal options.		5	4	3	2	1	
7. The amount of food I get is enough.		5	4	3	2	1	
8. The flavors of the food go well together.		5	4	3	2	1	
9. The staff look like they enjoy their work.		5	4	3	2	1	
10. There is variety in the menu from day to day.		5	4	3	2	1	
11. The food looks appealing.		5	4	3	2	1	
12. Food is cooked to the proper doneness.		5	4	3	2	1	
13. The food has a homemade quality.		5	4	3	2	1	
14. The service is friendly.		5	4	3	2	1	
15. I know that I can offer suggestions.		5	4	3	2	1	
16. There is enough seating space in the dining area.		5	4	3	2	1	
17. The serving portions are consistent.		5	4	3	2	1	
18. I know what is being served before I get to the cafeteria.		5	4	3	2	1	
19. I could purchase other items (a la carte) if I don't want the full meal.		5	4	3	2	1	
20. I have enough time to eat.		5	4	3	2	1	
21. The quality of the food is consistent.		5	4	3	2	1	
22. The overall quality (taste, appearance, temperature) of the food served is good.		5	4	3	2	1	
23. The overall quality of the service is good.		5	4	3	2	1	
24. The overall quality of my dining experience is good.		5	4	3	2	1	

SECTION II. Top reasons for eating school lunches**Instructions:**

Read the statements below. Please choose the TOP FIVE REASONS why you eat school lunches.

- | | |
|--|--|
| <input type="radio"/> It's convenient | <input type="radio"/> I like the variety of menu items |
| <input type="radio"/> I like the food | <input type="radio"/> My friends eat school lunches |
| <input type="radio"/> I am hungry | <input type="radio"/> My parents/I pay in advance |
| <input type="radio"/> I get a balanced meal | <input type="radio"/> I know what is being served |
| <input type="radio"/> I didn't bring anything to eat | <input type="radio"/> It fits my schedule |
| <input type="radio"/> I get to try different foods | <input type="radio"/> It prepares me for after school activities |
| <input type="radio"/> I have no choice | <input type="radio"/> It's affordable |

SECTION III. Tell us about you**Instructions:**

Please answer the following questions.

- What is your grade in school?
☐ 9th Grade ☐ 10th Grade ☐ 11th Grade ☐ 12th Grade
- On average, how many times PER WEEK do you eat school lunch?
☐ Two or less ☐ Three or more
- What is your gender?
☐ Male ☐ Female

Thank you for your time and input!

Appendix D: The Non-Participation Survey: Understanding Why High School Students Do Not Eat School Lunches (Asperin, Nettles, & Carr, 2010)



The Non-Participation Survey
Understanding Why High School Students Do Not Eat School Lunches

Completely fill in the circle of your answer. Use a #2 pencil.

Correct ●●● Use No. 2 Pencil Only Incorrect ✕ ● ✓

Your School Nutrition Program is interested in understanding why high school students do not eat or do not eat frequently in the school lunch program. Please reflect on these statements and answer based on your own experience.

SECTION I. Reasons for not eating school lunches

Instructions:

Please read the statements regarding reasons for not eating (or not eating frequently) school lunches. As you respond, use the phrase "My reason for not eating school lunches is that" before each statement and then indicate your level of agreement by using the scale 5 (Strongly Agree) to 1 (Strongly Disagree).

My reason for not eating school lunches is that...		Strongly Agree	5	4	3	2	1	Strongly Disagree
1.	The food does not taste good.	5	4	3	2	1		
2.	I prefer to eat what I bring from home.	5	4	3	2	1		
3.	The amount of food is inadequate.	5	4	3	2	1		
4.	There is not enough space in the dining room.	5	4	3	2	1		
5.	The staff is not friendly.	5	4	3	2	1		
6.	I do not like what is served.	5	4	3	2	1		
7.	I bring my own food.	5	4	3	2	1		
8.	The food does not appear nutritious.	5	4	3	2	1		
9.	My parents purchase food for me to take to school.	5	4	3	2	1		
10.	The food I like is gone before I get to the cafeteria.	5	4	3	2	1		
11.	I need time to catch up on school work.	5	4	3	2	1		
12.	I have to go to different lines to get the food I want.	5	4	3	2	1		
13.	I can not recognize what the food is.	5	4	3	2	1		
14.	The food choices do not change.	5	4	3	2	1		
15.	The staff does not speak to me.	5	4	3	2	1		
16.	The food does not appear fresh.	5	4	3	2	1		
17.	The choices offered are not those on the menu.	5	4	3	2	1		
18.	The food is not cooked correctly.	5	4	3	2	1		
19.	There are not enough places to sit.	5	4	3	2	1		
20.	The food does not look healthy.	5	4	3	2	1		
21.	I'm busy with school projects.	5	4	3	2	1		
22.	The food does not look appealing.	5	4	3	2	1		

SECTION I. (Continued)

My reason for not eating school lunches is that...		Strongly Agree					Strongly Disagree
23.	I do not get enough food.	5	4	3	2	1	
24.	They run out of food.	5	4	3	2	1	
25.	The staff is not always pleasant.	5	4	3	2	1	
26.	The cafeteria appears unclean.	5	4	3	2	1	
27.	The overall food quality is poor.	5	4	3	2	1	

SECTION II. Deciding to eat school lunches**Instructions:**

Please read the following statements that could influence your decision to start eating school lunches more frequently. As you respond, use the phrase, "I would be more likely to eat school lunches if..." before each statement, and then rate your level of agreement by using the scale 5 (Strongly Agree) to 1 (Strongly Disagree).

I would be more likely to eat school lunches if...		Strongly Agree					Strongly Disagree
1.	The overall quality (taste, appearance, temperature) of the food served were better.	5	4	3	2	1	
2.	There were more variety in the menu from day to day.	5	4	3	2	1	
3.	There were more healthy options available.	5	4	3	2	1	
4.	The staff were friendlier.	5	4	3	2	1	
5.	The wait in line were shorter.	5	4	3	2	1	
6.	The serving and dining areas were cleaner.	5	4	3	2	1	
7.	There were more seating space in the dining area.	5	4	3	2	1	
8.	I were allowed to sit with my friends during the meal period.	5	4	3	2	1	
9.	Menu items did not run out before the meal period was over.	5	4	3	2	1	
10.	I knew what was going to be on the menu before I got to the cafeteria.	5	4	3	2	1	
11.	The posted/announced menus were more accurate.	5	4	3	2	1	
12.	They served more menu items that I can recognize.	5	4	3	2	1	
13.	I received enough food to fill me up.	5	4	3	2	1	

SECTION III. Tell us about you**Instructions:**

Please answer the following questions.

- What is your grade in school?
☐ 9th Grade ☐ 10th Grade ☐ 11th Grade ☐ 12th Grade
- On average, how many times PER WEEK do you eat school lunch?
☐ Two or less ☐ Three or more
- What is your gender?
☐ Male ☐ Female

Thank you for your time and input!

Appendix E: District High School student lunch survey

Part 1: Tell Us About You

1. I have read the assent statement and agree to complete the survey. (yes, no)
2. What grade are you in? (9, 10, 11, 12)
3. Which high school do you attend? ()
4. What is your favorite food or meal to eat (at home, school, restaurant, etc)? (open text box)
5. Please indicate your gender. (Male, Female, prefer not to disclose)
6. How many times Each Week do you usually eat school lunch* (0, 1, 2, 3, 4, 5)

Part II: Non-participant survey

7. I do not eat a school lunch, but I do eat something during the lunch period. (yes/no)
8. During the lunch time I _____. (eat food from home, eat off campus, do not eat)
9. Please list the foods you are eating during the lunch time when you eat off campus.
10. When was the last time that you remember eating a school lunch? (during last school year, 2 years ago, 3 years ago, 4 years ago, do not remember, middle school, elementary school)
11. I would be more likely to eat school lunch if _____
 - It does not matter what you improve, I will not eat a school lunch.
 - the food was healthier.
 - the menu item I wanted did not run out during the lunch period.
 - the wait time in line was shorter.
 - menu items at school were similar to those I get off campus.
 - take-out meals were available (grab-n-go).
 - the taste of the food served was better.
 - I had time to spend with my friends during lunch
 - I knew what was on my schools' menu before lunch.
 - the appearance of the food served was better.
 - the food service staff was friendlier.
 - I had enough time to eat.
 - the temperature of the hot food and cold food served was appropriate.
 - there was more variety in the menu from day to day.

Part III: Participant survey (choose stars 1-strongly disagree, 5-strongly agree)

12. There are a variety of food items that I can select.
13. The food is appealing (healthy choices, flavor is fresh, smells good, correct temperature).
14. Use this textbox to tell us what we can do to improve the healthfulness, freshness, flavor, smell, or cooking (temperature) of the food.
15. The food has a "homemade" quality.
16. The service is friendly.
17. There is a variety in the menu from day-to-day.
18. There is enough available, the menu item I want does not run out during the lunch period.
19. I know what is on the menu before I get to the cafeteria.

- 20. I have enough time to eat my lunch.
- 21. I can spend time with my friends during lunch.
- 22. Picking up my meal is fast and convenient.
- 23. Use this textbox to tell us what changes to make to improve picking up your lunch.
- 24. The meal fills me up.
- 25. The serving and dining area is clean.
- 26. Overall the service is good
- 27. Overall, the quality of the food is good (taste, appearance, temperature).
- 28. I would recommend my friends to get their lunch from the cafeteria.
- 29. If you had a choice to eat off campus, would you prefer to do that during your lunch time? (yes, no, I already do eat off campus)
- 30. Where do you (or where would you) like to eat when you have lunch off -campus?
What is your favorite meal to have when eating off campus? (open text box)

Part IV: Tell Us Your Ideas (All Students)

31. I would be interested in _____ being added to the school lunch menu.
- vegetarian entrees
 - local foods
 - traditional/ethnic foods
 - fine dining/restaurant meals
 - I am not interested in adding entrees to the school lunch menu.
 - (Open text box)
32. From the items listed in the previous question (vegetarian entrees, local foods, traditional ethnic foods, fine dining, and restaurant meals) are there specific entrees you like? Please list the name of the entrée below.

Thank you page

Flow & Logic:

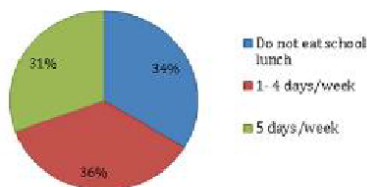
- Question 6: if answered "I do not lunch at school during the week" moved to questions 7-11, then 31. If answered any other option, moved to questions 12-31.
- Question 8: if answered "do not eat", skipped following question. All other responses moved to next question.
- Question 11: if answered "does not matter", moved to end of survey (Thank you page)
- Questions 13 & 22: if answered "strongly disagree" or "disagree", moved to next question with open text box. All other responses skipped following question.
- Question 29: if answered "no", skipped following question. All other responses moved to next question.
- Question 31: if answered "not interested", moved to end of survey (Thank you page)

Appendix F: School Lunch Survey- Report to Students

School Lunch Survey

1,184 high school students completed the survey! Thank you!

The pie chart shows the frequency that the 1,184 survey participants eat school lunches. There was almost an equal representation among the participants for eating a school lunch each day, sometimes, and not eating a school lunch.



Results

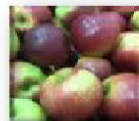
Highest rated areas of the school lunch program:

- ◊ Service is friendly
- ◊ Enough time to eat and spend time with friends during lunch



Students are Interested in:

- ◊ A "restaurant-like" dining experience
- ◊ Local foods



Areas of Improvement Identified

- ◊ Taste & appearance of the food
- ◊ Day-to-day variety
- ◊ Menu items similar to those off-campus
- ◊ Amount of food (serving) in a school lunch

82% of the survey participants are open to trying a school lunch if improvements are made

Foodservice Initiatives

- ◊ Emphasis on exceptional customer service & student-approved foods
- ◊ Free samples and taste testing of new items
- ◊ Cafeterias revamped with a "restaurant feel"
- ◊ Seasonally offering farm-fresh foods
- ◊ New NutriSlice phone app to view menus and rate foods



This institution is an equal opportunity provider.