

## Satisfaction of Middle School Lunch Program Participants and Non-Participants with the School Lunch Experience

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### ABSTRACT

#### Purpose/Objectives

The purpose of this study was to determine middle school students' satisfaction with the school lunch experience, using two validated surveys; the *Middle/Junior High School Student Participation Survey* and the *Middle/Junior High School Student Non-Participation Survey*, both developed by the National Food Service Management Institute (NFSMI).

#### Methods

A convenience sample of students from three Northern Colorado middle schools participated in a cross-sectional survey administered during the lunch period. Those who ate lunch three or more days per week were asked to take the Participation Survey and those eating school lunch fewer than three days per week were asked to take the Non-Participation Survey. Descriptive statistics and Cronbach's alpha reliability coefficients were calculated. Analysis of variance (ANOVA) was used to determine differences in survey factor means by participants' gender, grade level, and school.

#### Results

Two hundred eighty-eight Participation Surveys and 185 Non-Participation Surveys were used for analyses. Participation Survey results demonstrated that students perceived aspects of the foods served such as visual appeal, aroma, and taste as needing improvement. Sixth graders were more likely to agree than 8<sup>th</sup> graders that statements relating to food preference were reasons for eating school lunch (3.47 vs. 2.51,  $p < 0.0001$ ). Similarly, more than 50% of Non-Participation Survey respondents agreed or strongly agreed with 6 of 10 food quality statements.

#### Applications to Child Nutrition Professionals

Responses from both surveys indicated there are opportunities to gain and retain more students in the lunch program by improving factors related to food quality such as flavor, aroma, visual appeal, and freshness of foods served. By using these two surveys, school nutrition professionals will have an opportunity to learn about their students' attitudes toward and satisfaction with the school lunch program. This will aid them in providing the best possible school lunch environment for their student customers with the most effective use of resources.

**Keywords:** students, school lunch, satisfaction, middle school

### INTRODUCTION

Diets of middle school children continue to fall short of the U. S. Dietary Guidelines for Americans, particularly for fruit and vegetable intake (Krebs-Smith, Guenther, Subar, Kirkpatrick, & Dodd, 2010; Kimmons, Gillespie, Seymour, Serdula, & Blanck, 2009). Participating in the National School Lunch Program (NSLP) may help children aged 12-14 meet

dietary recommendations (Clark & Fox, 2009). Several studies have reported that students who participate in the NSLP have better nutrient intakes at lunch and consume a greater variety of dairy foods, fruits, vegetables, and whole grains than students who bring lunches from home (Hur, Burgess-Champoux, & Reicks, 2011; Hubbard, Must, Eliasziw, Folta, & Goldberg, 2014). Unfortunately, NSLP participation declines as children progress from elementary to middle school and then declines even further when they enter high school (Fox et al., 2012; Gordon et al., 2007; Litchfield & Wenz, 2011). Possible factors related to this decrease include growing desires of students to make their own food choices free from parental influence (Meyer, 2000; Roseman & Niblock, 2007), changing food and taste preferences including a preference for familiar foods off campus, such as fast food restaurants. (Noble, Corney, Eves, Kipps, & Lumbers, 2003; Roseman & Niblock, 2007), cafeteria food preparation and presentation, and the school food environment (Kubik, Hannan, Perry, & Story, 2003).

School food authorities (SFA) have sought input from students to prevent documented decreases in NSLP participation. A variety of methods are available for gathering student feedback, such as focus group discussions or student interviews; however, these may require more time and resources than school food authorities have available. Others may informally survey students; however, it can be challenging to assure a representative sample of respondents. Also, without using a valid survey with tested questions, confidence in the validity of the results is questionable.

The National Food Service Management Institute (NFSMI) recently developed two surveys; the *Middle/Junior High School Student Participation Survey* and the *Middle/Junior High School Student Non-Participation Survey*. The surveys are designed to assess students' perceptions about and satisfaction with school lunch, and results can guide improvements to school nutrition programs. Each was developed in two phases. Phase I used student and school nutrition professional focus group discussions to determine specific survey items. Phase II was a two-stage pilot test to refine and validate the surveys. Details about both phases of survey development were previously published elsewhere (Castillo, Lofton, & Nettles, 2011; Castillo & Lofton, 2012). This study used the final version of both surveys to measure middle school students' satisfaction with the school lunch experience in one Northern Colorado School District.

## **METHODOLOGY**

### **Study Design and Cafeteria Settings**

This cross-sectional student survey utilized a convenience sample to assess student satisfaction with the lunch program. Table 1 displays the NSLP participation of each middle school. Of the three schools, School C had the lowest enrollment and lowest free/reduced price eligibility. Schools B and C had similar cafeteria layouts, each with three tray lines from which students could purchase lunch. Students from School A entered the lunch line in single file and then split into two lines to purchase lunch. All three schools had a limited number of a la carte items available, such as baked chips, small cookies, bottled water, and carbonated fruit-flavored beverage. The schools differed in their lunch schedules. Schools A and B had three 30-minute lunch periods, one for each grade. School C had two 30-minute lunch periods with the 7<sup>th</sup> grade divided between the lunch periods. Menu items were prepared on site and pre-portioned in individual containers with students serving themselves. The Colorado State University Institutional Review Board and school district approved this study.

**Table 1. National School Lunch Program (NSLP) Demographics of Participating Middle Schools During School Year 2010-11**

	School A	School B	School C
School enrollment	645	653	570
FRPL <sup>1</sup> Eligibility (% of enrollment)			
Free	34.0	40.0	24.0
Reduced	11.0	9.3	7.1
Total free and reduced	45.0	49.3	31.0
ADP <sup>2</sup> (% of enrollment)	51.7	63.1	50.1

<sup>1</sup>FRPL, Free and reduced price lunch

<sup>2</sup>ADP, Average daily participation

All program data obtained from the district Nutrition Services Department

### **Description of Survey Instruments Developed by NFSMI**

Both the Participation and Non-Participation Surveys consisted of three sections. Section I of each survey contained 24 statements about school lunch program attributes such as food quality, menu choices and variety, service, and the dining area. On the Participation Survey, respondents were asked to use the phrase “When I eat school lunch..,” before each statement and then rate their level of agreement on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The Non-Participation Survey statements were similar to those on the Participation Survey; however, they were written in the negative. The Non-Participation Survey asked students to use the phrase “My reason for not eating school lunch is that...” before each statement and then rate their level of agreement, also on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree 5=strongly agree). Section II of the Participation Survey asked students to select their top five factors (from 14 provided) why they eat school lunch. The Non-Participation Survey asked students to select the top five factors (from 14 listed) that would encourage them to eat school lunch more often. Section III of both surveys asked students to provide grade level, the number of times per week they eat school lunch, and gender.

During Phase II of survey development, NFSMI conducted exploratory factor analyses on the statements in Section I of both the Participation and Non-Participation Surveys. Castillo and Lofton (2012) verified the reliability of two factors on each survey. On the Participation Survey, the factor “food preference” ( $\alpha=0.91$ ) related to qualities of the food served that appeal to middle school students, and “staff attentiveness” ( $\alpha=0.87$ ) related to school nutrition staff responsiveness and interaction with students. On the Non-Participation Survey, the factor “food quality” ( $\alpha=0.92$ ) related to the quality of the food served at lunch, and “customer service” ( $\alpha=0.80$ ) related to the approachability of the school nutrition staff.

### **Survey Administration**

Surveys were administered to students in the school cafeteria during a single lunch period on one day at each participating school. A survey administrator read a brief verbal assent statement explaining the purpose of the survey. The administrator also stated that participation was

voluntary and would not impact their grades and that the results were anonymous. Participant grade and gender were the only demographic characteristics collected.

For administration of the Participation Survey, district nutrition services used point-of-sale software (WinSnap, version 2.6.4, 2010, SLTech, Santa Monica, CA) to generate a list of 75-100 students (balanced by gender and grade level) per middle school who ate the NSLP meal three or more days a week. Cafeteria managers reviewed the list to confirm the selected students did indeed eat the reimbursable lunch three or more days per week. Each selected student was flagged in the district's database. On the day of survey administration as students progressed through the lunch line and paid for their meals, cashiers were alerted by their point-of-sale computers when a flagged student was selected to complete the survey. At that time, the student was directed to a nearby survey administrator, who then read the assent statement and asked the student to complete the survey. Assenting students were given the survey and a #2 pencil and asked to return the completed survey to a survey administrator.

For administration of the Non-Participation Survey, students eating lunch from home were visually identified in the school cafeteria by the absence of a school lunch tray and the presence of a personal lunch bag or cooler. A survey administrator approached those students and asked if they ate the reimbursable meal less than three days a week. Students answering affirmatively were read the assent statement, given a survey and a #2 pencil, and asked to return the completed survey to a survey administrator if they agreed to complete the survey. In an effort to balance grade levels and numbers of males and females completing the Non-Participation Survey, survey administrators were asked to approach a similar number of students from each grade and gender. For both surveys, students were allowed to take the full 30-minute lunch period to complete the survey while eating their lunch.

### **Data Analysis**

Respondents with substantive missing data, poor quality responses (i.e., those who answered all statements neutral or created an obvious pattern/design with their responses on the bubble sheet), or illegible responses were removed prior to analyses. Each survey was individually scanned into Data Blocks software by a Sekonic Optical Mark Reader (SR-23000). Once all remaining surveys were scanned, the data were saved as an SPSS file. Surveys were analyzed using SPSS, Version 20.0 for Windows. Descriptive statistics generated included means, standard deviations, and frequencies of total responses. Cronbach's alpha reliability coefficients were calculated to confirm the internal consistency of the factors for both surveys described above. Analysis of variance (ANOVA) was used to evaluate differences in Participation Survey factor means and Non-Participation Survey factor means by participants' gender, grade level and school. Because the Non-Participation Survey statements were written in the negative, a high mean score for any one statement indicated a negative opinion from the students. For all analyses, statistical significance was identified at  $p < 0.05$  level.

## **RESULTS AND DISCUSSION**

### **Participation Survey**

A total of 298 students completed the Participation Survey. Ten of the surveys were unusable because of an obvious pattern in responses or illegible scribbling over the response options on the survey, which prevented them from being read by the optical scanner. Approximately half of

respondents (55%, n=158) were female, and 39% (n=112), 35% (n=101), and 26% (n=75) were from 6th, 7th, and 8th grades respectively. Ninety-eight percent (n=283) of respondents ate lunch at school three more days a week, indicating they were regular participants in the school lunch program.

Table 2 shows the mean scores for each of the statements in Section I of the survey. The three statements with the highest level of agreement to the statement “When I eat school lunch...” were “I get to socialize with my friends” followed by “The food choices change every day” and “The menu offers healthy choices.” The three statements with the lowest level of agreement were “The food tastes homemade”, “The staff listens to my suggestions”, and “The food looks appealing”. Nineteen of the 24 statements in Section I received a mean score higher than 3, indicating agreement from respondents. This demonstrated that students who ate school lunch three or more days per week were generally positive about their school lunch experience. More than 60% (n=173) of students agreed or strongly agreed with the statements “The menu offers healthy choices” and “There are a variety of food choices,” indicating most students were satisfied with the variety of foods offered on the menu.

**Table 2. Participating Middle School Students Attitudes Toward School Lunch (N=288)**

<b>Participation Survey Statements<sup>a</sup></b>	<b>Score<sup>b</sup> <i>M ± SD</i></b>	<b>Strongly Agree + Agree (%)</b>
<i>When I eat school lunch...</i>		
<b>Statements in the Food Preference Factor (<math>\alpha=0.92</math>)</b>		
The menu offers healthy choices	3.67 ± 1.16	64.9
There is a variety of food choices	3.56 ± 1.16	59.5
The food is properly cooked	3.26 ± 1.16	48.8
The menu has food I like	3.24 ± 1.21	44.7
The food tastes good	3.15 ± 1.18	44.4
The food is fresh	3.14 ± 1.22	49.9
I am satisfied after I eat	3.08 ± 1.24	36.7
The food smells good	3.08 ± 1.26	41.6
The quality of the food is good	2.94 ± 1.20	34.4
The food looks appealing	2.91 ± 1.23	33.4
The food tastes homemade	2.34 ± 1.29	21.0
<b>Statements in the Staff Attentiveness Factor (<math>\alpha = 0.89</math>)</b>		
The service is good	3.61 ± 1.19	65.7
The staff is friendly	3.40 ± 1.33	53.2
The quality of the service is good	3.37 ± 1.19	51.4

The quality of the my lunch experience is good	3.28 ± 1.25	44.7
The staff looks like they enjoy their work	2.95 ± 1.36	40.2
The staff listens to my suggestions	2.77 ± 1.32	26.8
<b>Other Survey Statements</b>		
I get to socialize with my friends	4.37 ± .93	86.2
The food choices change every day	3.81 ± .97	69.8
I can buy other items if I don't want the meal	3.50 ± 1.26	57.0
There are enough seats in the dining area	3.45 ± 1.31	54.6
I know what is being served before I get to the cafeteria	3.24 ± 1.34	49.2
I have enough time to eat	3.19 ± 1.30	45.7
I get enough food to fill me up	3.15 ± 1.40	47.1

<sup>a</sup>Survey statements are organized by factor with corresponding reliability ( $\alpha$ ) calculated during analysis and in descending order of mean score

<sup>b</sup>Survey response scale = 5 (strongly agree) to 1 (strongly disagree)

Eleven Participation Survey statements were grouped together in a factor called food preference. These statements, which relate to aspects of the food being served, addressed qualities such as visual appeal, aroma, taste, freshness, and preparation and were highly related to each other as indicated by a Cronbach's alpha of 0.92 (Table 2). Several statements ("The food tastes good", "The food smells good", "The food looks appealing", and "The food is properly cooked") within the food preference factor showed a similar pattern of responses, with 30-50% (n=87-144) of respondents agreeing and 25% (n=72) neutral. These results indicate the majority of students perceive these aspects of the food could be improved. Since all of these statements relate to aspects of the food being served, addressing qualities such as visual appeal, aroma, and taste will likely further enhance students' school lunch experience.

Six Participation Survey statements were grouped together in a factor called staff attentiveness. These statements relate to aspects of service such as friendliness of the staff and listening to suggestions and are highly related to each other as indicated by a Cronbach's alpha of 0.89 (Table 2). Several statements within the staff attentiveness factor ("The service is good", "The staff is friendly", "The quality of the service is good", and "The quality of my lunch experience is good") generally had above average levels of agreement with mean scores for four of the six statements above 3. However, the statement "The staff listens to my suggestions" had the second to lowest level of agreement on the survey. This result indicated respondents were generally satisfied with cafeteria staff performance, but feel student suggestions for improvement are disregarded.

ANOVA for Participation Survey factor means between grade levels showed a significant difference for both the food preference and staff attentiveness factors, where 6<sup>th</sup> graders were more likely to agree than 8<sup>th</sup> graders that food preference (3.47 vs. 2.51,  $p < .0001$ ) and staff attentiveness (3.33 vs 2.90,  $p = .009$ ) were reasons for eating school lunch (Table 4). Staff attentiveness varied by school with school B the least likely to agree with statements related to

staff performance as a reason for eating school lunch. There was no difference in the mean factor scores for food preference or staff attentiveness between male and female respondents. No differences for food preference were found across middle schools, nor was there a significant interaction between grade, gender and school; therefore, only the main effects were explored in the analysis and reported here.

In section II of the Participation Survey, the top reasons students gave for eating school lunch were “I am hungry” (77%, n=222), “I get to sit with my friends” (63%, n=181), and “I didn’t bring anything to eat” (49%, n=141). The three least cited reasons for eating school lunch were “My parents pay in advance” (18%, n=52), “I get to try different foods” (17%, n=49), and “I get a homemade meal” (2%, n=6).

### Non-Participation Survey

A total of 295 students completed the Non-participation Survey. Fourteen of the surveys were unusable because of an obvious pattern of responses or illegible scribbling across the response options, which prevented the optical scanner from reading the survey. One-third (n=96) of Non-Participation Survey respondents answered that they ate lunch at school more than three days a week, indicating they did not meet the survey definition of non-participants in the school lunch program. These surveys were removed from the data set, and the remaining 185 were used for analysis. Sixty-eight percent (n=126) of Non-Participation respondents were female, while 36% (n=67) were in 6<sup>th</sup> grade, 27% (n=50) in 7<sup>th</sup> grade, and 37% (n=68) in 8<sup>th</sup> grade.

Table 3 shows the mean scores for each of the statements in Section I of this survey. The three statements with the highest level of agreement were “There are long lines”, “I prefer to eat what I bring from home”, and “The food does not look appealing”. The three statements with the lowest level of agreement were “I do not get to sit with my friends”, “The food served is the same every day”, and “The staff is not friendly”.

**Table 3. Non-participating Middle School Students Attitudes Toward School Lunch (N=185).**

Non-Participation Survey Statement <sup>a</sup>	Score <sup>b</sup> M ± SD	Strongly Agree + Agree (%)
<i>My reason for not eating school lunch is...</i>		
<b>Statements in the Food Quality Factor (<math>\alpha=0.90</math>)</b>		
The food does not look appealing	3.82 ± 1.15	67.1
The food does not look fresh	3.79 ± 1.16	65.4
The food does not look healthy	3.70 ± 1.22	58.4
The quality of the food is poor	3.58 ± 1.14	53.0
The food does not taste good	3.54 ± 1.14	58.4
The menu does not have food I like	3.43 ± 1.30	52.4
I do not like the food being served	3.40 ± 1.20	48.6
The food is not properly cooked	3.32 ± 1.18	43.2

I do not recognize the food being served	3.28 ± 1.18	42.8
There is no variety of food choices	3.06 ± 1.11	33.6
<b>Statements in the Customer Service Factor (<math>\alpha=0.77</math>)</b>		
The service is poor	3.07 ± 1.06	28.7
The staff does not speak to me	3.00 ± 1.22	30.9
The cafeteria does not look clean	3.00 ± 1.17	33.5
The food choices offered are not the same as the menu	2.87 ± 1.31	24.9
The staff is not friendly	2.74 ± 1.30	27.1
<b>Other Survey Statements</b>		
There are long lines	4.41 ± .96	87.0
I prefer to eat what I bring from home	4.06 ± 1.04	77.8
My parents buy food for me to take to school	3.62 ± 1.30	62.4
The food I like runs out before I get to the cafeteria	3.55 ± 1.17	52.5
I do not have enough time to eat	3.29 ± 1.32	45.9
I do not get enough food to fill me up	3.02 ± 1.24	36.3
There are not enough seats in the dining area	2.79 ± 1.40	32.5
The food served is the same every day	2.64 ± 1.18	22.1
I do not get to sit with my friends	2.01 ± 1.20	14.1

<sup>a</sup>Survey statements are organized by factor with corresponding reliability ( $\alpha$ ) calculated during analysis and in descending order of mean score.

<sup>b</sup>Survey response scale = 5 (strongly agree) to 1 (strongly disagree).

Ten Non-Participation Survey statements were grouped together in a factor called food quality. These statements, which related to aspects of the food being served, addressed qualities such as visual appeal, aroma, taste, freshness, and preparation and were highly related to each other as indicated by a Cronbach's alpha of 0.90. Within the food quality factor, more than 50% of students agreed with several of the statements such as "The food does not taste good", "The food does not look healthy", "The food does not look fresh", and "The food does not look appealing". These items are similar to those on the Participation Survey in the FP factor. Taken together, both the Participation Survey and Non-Participation Survey results demonstrated there is room to improve aspects related to the food itself.

Five Non-Participation Survey statements were grouped together in a factor called customer service. These statements, which related to aspects of service such as friendliness of the staff and listening to suggestions, were highly related to each other as indicated by a Cronbach's alpha of 0.77. Several statements within the customer service factor ("The staff is not friendly", "The cafeteria does not look clean", "The food choices offered are not the same as the menu", and "The staff does not speak to me"), generally had low levels of agreement with one-third or fewer students agreeing or strongly agreeing with these statements. This indicated the staff may not be

a primary reason for students not eating school lunch, but improvements could also be made in the area of customer service.

ANOVA for Non-Participation factor means indicated a significant difference between 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> graders' responses for the food quality factor (Table 4). There was a consistent decrease in mean scores from 6<sup>th</sup> to 7<sup>th</sup> to 8<sup>th</sup> grade with 8<sup>th</sup> graders having the most unfavorable opinions of food quality. When comparing mean factor scores by school, respondents from school B had a less favorable view of customer service than schools A or C. There was no difference for food quality or customer service between male and female respondents, nor was there a significant interaction between grade, gender, and school. Therefore, only the main effects of the ANOVA are reported here.

**Table 4. Least-squared (LS) Mean Factor Scores and Standard Error of the Mean (SEM) by Grade, Gender, and School for Middle School Respondents to Participation (n=288) and Non-Participation (n=185) Surveys.**

	Participation Survey <sup>c</sup>				Non-Participation Survey <sup>c</sup>			
	Food Preference		Staff Attentiveness		Food Quality		Customer Service	
	LS Mean	SEM	LS Mean	SEM	LS Mean	SEM	LS Mean	SEM
Overall	3.07	.05	3.21	.06	3.48	.07	2.91	.07
Grade								
6	3.47 <sup>a</sup>	.08	3.33 <sup>a</sup>	.09	3.15 <sup>a</sup>	.10	2.84	.10
7	3.24 <sup>a</sup>	.08	3.40 <sup>a</sup>	.10	3.48 <sup>a</sup>	.12	2.80	.12
8	2.51 <sup>b</sup>	.10	2.90 <sup>b</sup>	.12	3.80 <sup>b</sup>	.10	3.09	.10
Gender								
Male	3.09	.08	3.17	.09	3.39	.11	2.88	.11
Female	3.06	.07	3.26	.08	3.56	.08	2.94	.07
Schools								
A	3.18	.07	3.50 <sup>a</sup>	.09	3.39	.10	2.69 <sup>a</sup>	.10
B	2.90	.09	2.69 <sup>b</sup>	.10	3.53	.10	3.12 <sup>b</sup>	.10
C	3.14	.11	3.45 <sup>a</sup>	.13	3.50	.12	2.85	.12

<sup>a,b</sup>Mean values within a column with unlike superscript letters were significantly different ( $p < 0.05$ ).

<sup>c</sup>Survey response scale for both surveys = 5 (strongly agree) to 1 (strongly disagree).

In section II of the Non-Participation Survey, more than 60% of respondents said they would be more likely to eat school lunch with better tasting food, better quality food, and shorter lines. These responses were consistent with those from section I of the survey in which students agreed there were long lines and food quality could be improved. The least cited reasons for not eating

school lunch were “better service” (11%, n=20), “cleaner cafeteria” (10%, n=19), and “more accurate menu” (5%, n=9).

### **Strengths and Limitations**

A major strength of this study is that the responses to these two validated survey instruments add to the relatively limited research about middle school students’ attitudes towards and satisfaction with school lunch. The study also responded to a school district need and provided practical and useful information to the school nutrition staff about students’ school lunch perceptions.

However, the results from these surveys are not generalizable since the participants were drawn from three schools in one district. The surveys were administered in the school cafeteria during lunch, resulting in a noisy and chaotic environment with possible peer influence on the responses. Due to the participating schools’ schedules, it was not possible to administer the surveys at any other time. Additionally, the number of surveys that were lost to unreadable responses, patterned responses, or inaccurate categorization may have biased the results. Lastly, 78% of the Non-Participation Survey responses were from female students, potentially biasing the results from this survey.

## **CONCLUSIONS AND APPLICATION**

The purpose of this study was to determine middle school students’ satisfaction with the school lunch program experience, using two validated survey instruments developed by NFSMI; the *Middle/Junior High School Student Participation Survey* and the *Middle/Junior High School Student Non-Participation Survey*. Students responding to the Participation Survey had the highest level of agreement with the statement “When I eat school lunch, I get to socialize with my friends” and included “I get to sit with my friends” among the top five reasons for eating school lunch. This result suggests that students value the time they have during to the school day to simply sit and socialize with their friends. While the school schedule is not within cafeteria staff’s control, making the cafeteria as pleasant an environment as possible could help retain students in the NSLP (Center for Ecoliteracy, 2010; Moore, Murphy, Tapper, & Moore, 2010). Cafeteria and school staff could arrange the dining area to support social interaction among students, make students feel welcome, and show a personal interest. To encourage/retain student participation, lunch staff can promote school lunch as an opportunity to relax from academics and participate in a social lunch experience.

The statement “The staff listen to my suggestions” had the second to lowest level of agreement on the Participation Survey. This result indicated students feel that their input is disregarded when they provide suggestions. Wojcicki and Heyman (2006) reported higher NSLP participation when middle school students were polled about their food preferences and asked to participate in the process of implementing specific changes to the school lunch menu.

Respondents to the Non-Participation Survey strongly agreed with the statement “My reason for not eating school lunch is that there are long lines”. Therefore, middle school students would be more likely to eat school lunch if the lines were shorter. Shortening lunch lines may be achievable with increased efficiency through staff training and modifying the layout of food items. However, some factors influencing lunch line length, such as the school schedule,

physical tray line layout, number of point of sale terminals, and number of cashiers, may be beyond the operational control of the cafeteria staff.

Responses from both surveys indicated there are opportunities for this Northern Colorado school district to gain and retain more students in the school lunch program by improving food quality such as flavor, aroma, visual appeal, and freshness. Several previous studies have reported taste and visual attractiveness are the most important factors when students decide whether to eat school lunch (Meyer, 2000) or what to eat for lunch (Roseman & Niblock, 2007; Wojcicki & Heyman, 2006). School nutrition professionals should not only seek input from students but also involve them in the process of implementing changes to school lunch menus. This can be accomplished by establishing student advisory groups and conducting regular taste tests (Lytle et al., 2004; Wojcicki & Heyman, 2006). Student feedback could also be considered with long-term strategic planning.

Mean scores of 6<sup>th</sup> grade students were significantly higher than 7<sup>th</sup> and 8<sup>th</sup> grade students for the food preference factor on the Participation Survey and the food quality factor on the Non-Participation Survey. These findings suggest that 6<sup>th</sup> graders are more likely than 7<sup>th</sup> and 8<sup>th</sup> graders to be satisfied with the food served during school lunch. This is consistent with the research findings of Roseman and Niblock (2007) who also reported higher school lunch satisfaction levels among 6<sup>th</sup> grade students. Overall, lunch satisfaction declines from 6<sup>th</sup> to 8<sup>th</sup> grade. If school nutrition professionals can identify the specific factors, such as focusing on quality and service, that would attract and keep 8<sup>th</sup> grade students in the NSLP, it may be possible to mitigate the decline in participation from elementary to middle school.

NFSMI recently published the *Middle/Junior High School Participation and Non-Participation Survey Guide: Internal Benchmarking for School Nutrition Programs* (Rushing, 2012). The guide is designed to provide school nutrition directors step-by-step instructions for administering the surveys and tabulating and analyzing the responses. Also included is additional NFSMI information about customer service and continuous quality improvement. By using the surveys in conjunction with this administration guide, school nutrition professionals will learn about student satisfaction with school lunch and how best to meet student preferences to increase student satisfaction. The information will aid school nutrition professionals with providing the best possible school lunch environment for their customers with the most effective use of resources. The data collected could also serve as a baseline for assessing effectiveness of changes to the food or school lunch environment.

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## REFERENCES

- Castillo, A., & Lofton, K. L. (2012). *Development of middle/junior high school student surveys to measure factors that impact participation in and satisfaction with the National School Lunch Program*. University, MS: National Food Service Management Institute. Retrieved from <http://www.nfsmi.org/documentlibraryfiles/PDF/20120402024129.pdf>
- Castillo, A., Lofton, K. L., & Nettles, M. F. (2011). *Determining factors impacting the decision of middle/junior high school students to participate in the National School Lunch Program*. University, MS: National Food Service Management Institute. Retrieved from <http://www.nfsmi.org/documentlibraryfiles/PDF/20110405033503.pdf>
- Center for Ecoliteracy. (2010). *Rethinking school lunch: A planning framework from the Center for Ecoliteracy*. Berkeley, CA. Retrieved from [http://www.ecoliteracy.org/sites/default/files/uploads/rethinking\\_school\\_lunch\\_guide.pdf](http://www.ecoliteracy.org/sites/default/files/uploads/rethinking_school_lunch_guide.pdf)
- Clark, M. A., & Fox, M. K. (2009). Nutritional quality of the diets of US public school children and the role of the school meal programs. *Journal of the American Dietetic Association, 109*(2, Supplement), S44–S56. doi:10.1016/j.jada.2008.10.060
- Fox, M. K., Condon, E., Crepinsek, M. K., Niland, K., Mercury, D., Forrestal, S., ... Killewald, A. (2012). *School Nutrition Dietary Assessment Study-IV: Volume I: School foodservice operations, school environments, and meals offered and served*. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis. Retrieved from [http://www.fns.usda.gov/sites/default/files/SNDA-IV\\_Vol1Pt1\\_0.pdf](http://www.fns.usda.gov/sites/default/files/SNDA-IV_Vol1Pt1_0.pdf)
- Gordon, A., Fox, M. K., Clark, M., Nogales, R., Condon, E., Gleason, P., & Sarin, A. (2007). *School Nutrition Dietary Assessment Study-III: Volume II: Student participation and dietary intakes*. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis. Retrieved from <http://www.fns.usda.gov/sites/default/files/SNDAIII-Vol2.pdf>
- Hubbard, K. L., Must, A., Eliasziw, M., Folta, S. C., & Goldberg, J. (2014). What's in children's backpacks: Foods brought from home. *Journal of the Academy of Nutrition & Dietetics, 114*(9), 1424–1431. doi:10.1016/j.jand.2014.05.010
- Hur, I., Burgess-Champoux, T., & Reicks, M. (2011). Higher quality intake from school lunch meals compared with bagged lunches. *ICAN: Infant, Child, & Adolescent Nutrition, 3*(2), 70–75. doi:10.1177/1941406411399124
- Kimmons, J., Gillespie, C., Seymour, J., Serdula, M., & Blanck, H. M. (2009). Fruit and vegetable intake among adolescents and adults in the United States: Percentage meeting individualized recommendations. *The Medscape Journal of Medicine, 11*(1), 26.
- Krebs-Smith, S. M., Guenther, P. M., Subar, A. F., Kirkpatrick, S. I., & Dodd, K. W. (2010). Americans do not meet federal dietary recommendations. *Journal of Nutrition, 140*(10), 1832–1838. doi:10.3945/jn.110.124826

Kubik, M. Y., Leslie A., Hannan, P. J., Perry, C. L., & Story, M.. (2003). The association of the school food environment with dietary behaviors of young adolescents. *American Journal of Public Health, 93*(7), 1168–1173.

Litchfield, R. E., & Wenz, B. (2011). Influence of school environment on student lunch participation and competitive food sales. *Journal of Child Nutrition & Management, 35*(1). Retrieved from <https://www.schoolnutrition.org/JCNM/>

Lytle, L. A., Murray, D. M., Perry, C. L., Story, M., Birnbaum, A. S., Kubik, M. Y., & Varnell, S. (2004). School-Based approaches to affect adolescents' diets: Results from the TEENS study. *Health Education & Behavior, 31*(2), 270–287. doi:10.1177/1090198103260635

Meyer, M. K. (2000). Top predictors of middle/junior high school students' satisfaction with school food service and nutrition programs. *Journal of the American Dietetic Association, 100*(1), 100–103. doi:10.1016/S0002-8223(00)00031-6

Moore, S. N., Murphy, S., Tapper, K., & Moore, L. (2010). The social, physical and temporal characteristics of primary school dining halls and their implications for children's eating behaviours. *Health Education, 110*(5), 399–411. doi:10.1108/09654281011068540

Noble, C., Corney, M., Eves, A., Kipps, M., & Lumbers, M. (2003). Food choice and secondary school meals: The nutritional implications of choices based on preference rather than perceived healthiness. *International Journal of Hospitality Management, 22*(2), 197–215. doi:10.1016/S0278-4319(03)00018-5

Roseman, M., & Niblock, J.R. (2007). A culinary approach to healthy menu items: Middle school students' opinion of school lunch and lunch decision factors. *Journal of Culinary Science & Technology, 5*(1), 75–90. doi:10.1300/J385v05n01\_08

Rushing, K. (2012). *Middle/Junior High School Participation and Non-Participation Survey Guide: Internal Benchmarking for School Nutrition Programs*. University, MS: National Food Service Management Institute. Retrieved from <http://www.nfsmi.org/documentlibraryfiles/PDF/20130405095131.pdf>

Wojcicki, J. M., & Heyman, M. B. (2006). Healthier choices and increased participation in a middle school lunch program: Effects of nutrition policy changes in San Francisco. *American Journal of Public Health, 96*(9), 1542–1547.

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