

Current Practices for Providing School Field Trip Meals: Perspectives of School Nutrition Managers and Teachers

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ABSTRACT

Purpose/Objectives

The Healthy, Hunger Free Kids Act of 2010 extended the requirements for a school food safety program to wherever food is stored, prepared, or served, including meals for field trips. The purpose of this study was to determine what foods are used for field trip meals, how those foods are transported and stored, and what standard operating procedures are in place to guide school nutrition personnel and teachers in providing safe meals.

Methods

Two written questionnaires were developed for collecting information from a random national sample of school nutrition managers and teachers. The questionnaires were developed and delivered using Qualtrics®. A total of approximately 4,000 school nutrition managers and 4,000 teachers were contacted, and 192 school nutrition managers and 80 teachers responded.

Results

Many foods, such as deli sandwiches, served on field trips require time and temperature control for safety. Most school nutrition managers reported to transport food in coolers with ice or ice packs, but nearly 30% did not. Food safety for meals served on field trips was not viewed as a concern by managers or teachers, and few teachers reported to have any food safety information or training.

Application to Child Nutrition Professionals

School nutrition directors can use these results to examine current field trip meals, develop standard operating procedures, purchase equipment, and provide training to promote the safety of food served on field trips. Results emphasize the need to have good communication with teachers about the importance of food safety and identify areas where research is needed.

Keywords: field trip meals; food safety; food temperature control

INTRODUCTION

Food safety has been a concern for school nutrition program professionals for many years (Almanza & Sneed, 2003). Some of the first food safety research in schools focused on food safety practices of employees (Giampaoli, Cluskey, & Sneed, 2002; Henroid, Mendonca, & Sneed, 2004), attitudes toward and readiness to implement Hazard Analysis and Critical Control Point (HACCP) programs (Giampaoli, Sneed, Cluskey, & Koenig, 2002; Henroid & Sneed, 2004), implementation of HACCP and prerequisite programs (Sneed & Henroid, 2003; Youn & Sneed, 2003), training and perceived barriers to implementing food safety practices (Youn & Sneed, 2002), and the impact of educational interventions on HACCP implementation (Sneed &

Henroid, 2007). This research was conducted prior to the requirement for food safety programs based on HACCP schools.

The WIC (Women, Infants, and Children) and Child Nutrition Reauthorization Act of 2004 (S. 2507, 2004) included a requirement that all schools have a food safety program based on HACCP principles and a requirement that all schools have two health inspections each year. Section 302 of the Healthy, Hunger Free Kids Act (2010) extended the requirement for the application of a food safety program throughout the entire campus wherever food is stored, prepared, or served as part of the school meals program. Meals that are provided by the school nutrition program and served on field trips would be included in this requirement.

In 2013 a team of researchers examined how HACCP programs were being implemented in schools (Roberts, et al., 2014). Research up to this point has focused primarily on food safety at the school site.

While temperature control of food can be a challenge in any school nutrition operation, it is even more challenging for meals served off premises on field trips. These meals are out of the managerial control of the school nutrition staff, available equipment may be inadequate to maintain appropriate temperatures, there may be delays in lunch times, hand washing facilities may be inadequate, and high ambient air temperatures that may be associated with field trips compared to the school cafeteria could pose greater risks to the safety of these meals. To our knowledge, no research has been done to examine how field trip meals are handled in schools.

In related studies, Almansour et al. (2011) examined the temperature of foods in sack lunches that parents sent with their preschool children. These researchers found that sack lunches contained at least one perishable food item and that greater than 90% of the food items were at unsafe temperatures, even when parents used ice packs in the lunches. They found that only 22 of 1,361 items (1.6%) were at safe temperatures. These sack lunches were held at ambient temperature and were not exposed to higher than ambient temperatures. Strohbehn, Litchfield, and Salow (2012) reported results of an informal study of temperatures of eight sandwich treatments, all held in conditions simulating school lockers. By 9:00 am, all but two sandwiches were in the temperature danger zone, and by noon all sandwiches were in the temperature danger zone.

Kim, Yun, Lee, Hwang, and Rhee (2013) conducted a study to determine the temperature of foods when transported in a car trunk exposed to sunlight. They found that food temperatures dramatically increased immediately after storage in the car trunk and that the temperature of refrigerated foods reached the temperature danger zone within the first 10 minutes in the trunk. While this study focused on consumer food handling practices, the findings may be similar to what occurs with field trip meals.

The paucity of research related to school field trip meals led us to conduct this exploratory study. The purposes in this study were to: 1) Identify foods that are frequently provided by the school meals program for field trips, especially those that require time and temperature control for safety (TCS); 2) Discover primary methods used for transporting and storing field trip meals;

3) Identify current school board or nutrition program policies and standard operating procedures (SOPs) related to field trip meals, including training provided to teachers and volunteers.

METHODOLOGY

Sample

Two samples were included in the study, school nutrition managers and teachers. The school-level nutrition manager was selected rather than the district-level director because researchers believed that managers would have more direct knowledge of what actually happens in the school operation related to the provision of meals to be served off site. A sample of teachers was included because they would have knowledge of how the food is handled after it leaves the school kitchen. Both perspectives were important to understand the scope of food handling for school field trip meals. The random national samples were purchased from MDR, a marketing company that maintains databases of contact information for various groups (www.schooldata.com). The samples were not selected based on any factors such as location, enrollment, grade level, or management type. The survey was sent to 3,926 school-level managers and 4,083 teachers.

Questionnaires

Two questionnaires were developed, one for school nutrition managers and one for teachers. Both questionnaires included a screening question at the beginning to determine whether or not meals for field trips were provided or if students were taken on field trips. Both questionnaires were developed and distributed using Qualtrics®, the on-line survey system utilized by Kansas State University. The school manager survey consisted of 43 questions with open-ended and multiple choice responses. The general categories of questions included frequency of offering various types of food, how food was packaged and transported, equipment used for transporting meals, use of standard operating procedures, food safety concerns, training provided, and characteristics of the schools. Several questions asked for frequency responses (i.e. frequency of offering various sandwich/wraps, salads, fruits, vegetables) using the scale frequently, occasionally, or not at all. Some questions for the survey of school nutrition managers were generated by a group of staff members from the United States Department of Agriculture (USDA). The Center of Excellence for Food Safety Research in Child Nutrition Programs (Center) staff developed a draft questionnaire, which was reviewed by the USDA committee and suggested changes were made. The questionnaire was then pilot tested with 12 school nutrition managers and minor modifications such as adding menu items and clarifying wording were made based on their comments.

The 25-item teacher questionnaire was developed based on the school nutrition manager questionnaire. Researchers eliminated all questions from the school nutrition manager questionnaire related to foodservice operations, focusing instead on frequency of use of various menu items, who picks up food from the school cafeteria, how foods are packaged, how foods are transported to and stored at the field trip site, time elapsed before students eat their lunch, frequency of hand washing and use of sanitizers, disposition of leftovers, availability of standard operating procedures, and food safety concerns and training. Responses were multiple choice or open-ended. The survey was pilot tested with four teachers in Kansas.

Research Approval

The research protocol was approved by the Kansas State University Institutional Review Board prior to data collection. All researchers involved in the study completed mandatory human subjects training.

Data Collection

Researchers provided MDR with a cover letter for school nutrition managers and one for teachers. The cover letters explained the purpose of the study, encouraged participation in the survey, explained the rights of human subjects, provided contact information if participants had questions, and provided a link to take the survey. MDR sent the cover letter as an email to the study samples in May 2014.

A follow-up email was developed for non-responders based on the original cover letter. This letter encouraged participation. MDR sent the follow-up letters to all non-responders one week after the original survey was deployed. No incentives were provided.

Data Analysis

Data for both questionnaires were exported from Qualtrics® as SPSS files. SPSS was used for all data analysis. For this study, descriptive statistics were calculated including frequencies and percentages.

RESULTS AND DISCUSSION

Study Samples

School nutrition managers. A total of 267 school nutrition managers started the survey, a response rate of 7%. The initial question determined which managers were employed in schools that provided meals for field trips. Of those, 224 (86%) reported that their school provided meals for field trips, and 35 (14%) reported that they did not provide field trip meals. A total of 192 (86%) managers who provided field trip meals completed the survey. This is a very low response rate, even though a follow-up email was sent. The low response rate may be due to factors such as the accuracy of the database, issues with firewalls in school districts, time of year the survey was deployed (in May), interest by the school manager, or lack of involvement in providing meals for field trips. In addition, foodservice managers at the school level may not typically be involved in research or responding to surveys and may not feel empowered to respond. This assertion is based on the fact that two district foodservice directors contacted the researchers wanting to know why their managers were contacted. Further, some site managers may not have easy access to computers to check email frequently. Thus, results of this study should be interpreted cautiously because of the low response rate; yet, the results do provide some good insight into field trip meals.

The managers represented 34 states, and 74% operated conventional food production systems. Most (72%) were managers in elementary schools, while 15% were managers in middle schools and 13% were managers in high schools.

Teachers. A total of 80 teachers responded for a response rate of 2%. This also is a very low response rate, even though a follow-up email was sent. The low response rate may be due to

factors such as the time of year the survey was deployed (in May, which is near the end of the school year), accuracy of database, issues with firewalls in school districts, interest of teachers, lack of involvement in field trips, lack of involvement in research, or lack of perceived relevancy of this research to them. Teacher responses do provide insight about field trips from a teachers' perspective. Of the 80 teachers responding, 59 were involved with field trips, and 34 were teachers at the elementary level. Teachers reported that about equal numbers of student field trip meals were from the school cafeteria and brought from home. The way the data were reported, it cannot be determined if this was half of the field trips or half of the meals for each field trip.

Foods Served on Field Trips

The types of foods school nutrition managers typically provided for field trips are summarized in Table 1. All 192 respondents did not answer every question. Approximately two thirds of respondents indicated they provided deli sandwiches (67%) and nut butter and jelly sandwiches (65%) as part of field trip meals frequently or occasionally with 56 of respondents saying these were never provided. Condiments such as mustard and mayonnaise were provided as single-serving packets by 97% of schools. Whole fruit and commercially packaged raw vegetables were served frequently. A small percentage (21%) provided green salads, and few (14%) reported that lettuce or tomato for deli sandwiches was included. Leafy greens and cut tomatoes have been associated with outbreaks and it is recommended that these foods be kept below 41 °F to minimize bacterial growth (U.S. Department of Health & Human Services [USDHHS], 2009; USDHHS, 2013). The frequent use of TCS foods means that cold storage is important for the safety of these lunches.

Table 2 summarizes the types of foods that about half of responding teachers reported were provided for field trips either by the school or brought from home. Deli sandwiches made with turkey, ham, or other deli meats was the item most often provided by the school (22 of 43 respondents) and reported as the second highest item brought from home (20 of 43). Convenience lunches (such as Lunchables™) were the food item reported to be brought from home most often (23 of 43 respondents). Milk often was provided with school meals but rarely provided in meals brought from home. Salads typically were not provided either in meals provided by the school or those brought from home.

Preparing, Packaging, Transporting Field Trip Meals

Preparing. Most managers reported that meals are prepared the day of the field trip either frequently (79%) or occasionally (17%). Some reported that meals were prepared the day before (32% frequently, 25% occasionally) while very few (4 %) reported that preparation occurred two days before the field trip.

One-third of the school managers typically prepare 20 or fewer meals, and 57% prepare 40 or fewer meals. A small percentage reported washing and cutting/slicing fresh fruits. Of those who did, oranges and apples were the fruits most often processed. School nutrition managers reported that the typical length of time that field trip meals were at room temperature between preparation and pick up was less than one hour.

Table 1. Frequency (%) of Food Items Used for Field Trip Meals as Reported by School Nutrition Managers (N=192)

Food Items	Frequently	Occasionally	Not at All	n
Sandwiches/wraps				
Nut butter and jelly sandwiches	79	27	56	162
Turkey, ham, and other deli meat	78	37	56	171
Low sodium turkey, ham, and other deli meat	48	27	74	149
Tuna, chicken, or egg salad	1	6	134	141
With cheese added	71	31	60	162
With lettuce added	11	9	124	144
With tomato added	8	6	130	144
Other	6	5	76	87
Green (lettuce-based) salads				
With deli meat	16	6	150	172
With other meat	4	3	149	156
With cheese	26	9	128	163
With cut tomatoes	7	5	147	159
Other	3	0	120	123
Other protein items				
String cheese	30	44	102	176
Yogurt	2	12	149	163
Cold pizza	1	1	160	162
Hot pizza	0	0	159	159
Fruits				
Whole fruit	157	15	10	182
Individual, prepackaged fruit (e.g., applesauce)	33	44	83	160
Sliced or chopped fresh fruits (commercially prepackaged)	32	40	83	155
Sliced or chopped fresh fruits (school prepared)	23	16	116	155
Dried fruit	22	39	92	153
Other	3	2	70	75
Vegetables				
Commercially prepared, individually packaged (e.g., baby carrots)	99	29	38	166
School prepared other cut vegetables (e.g., carrots, celery, cucumbers)	39	34	88	161
School prepared whole, uncut vegetables (e.g., baby carrots, cherry tomatoes)	35	25	98	158
School prepared cut lettuce	8	6	141	155
School prepared cut tomatoes (with or without salad)	6	8	141	155
Beverages				
Pasteurized fluid milk needing refrigeration	123	21	32	176
Juice	66	43	46	155
Ultra-high-temperature (UHT) milk	4	7	121	132

Note: All respondents did not answer every question.

Table 2. Food Items Provided for Field Trip Meals as Reported by Teachers (N=80)

	Frequently	Occasionally	Not at All	n
Food items provided by the school				
Turkey, ham, and other deli meat sandwiches	22	9	10	41
Milk	22	6	12	40
Nut butter and jelly sandwiches	13	12	15	40
String cheese	9	8	20	37
Tuna salad, chicken salad, or egg salad sandwiches	2	0	34	36
Pizza (hot or cold)	2	1	33	36
Green (i.e., lettuce) salads	1	3	31	35
Yogurt	0	2	33	35
Food items brought from home				
Convenience/pre-packaged lunches (e.g., Lunchables™)	23	12	4	39
Turkey, ham, and other deli meat sandwiches	20	13	6	39
Nut butter and jelly sandwiches	15	14	9	38
Yogurt	4	17	16	37
Tuna salad, chicken salad, or egg salad sandwiches	2	7	28	37
Green (i.e., lettuce) salads	2	6	29	37
Milk	2	8	27	37
String cheese	2	25	10	37
Pizza (hot or cold)	2	15	19	36

Note: All respondents did not answer every question.

Packaging/transporting. The majority of school nutrition managers (69%) reported that field trip meals are packaged in individual sacks or boxes. It is surprising that more did not report packaging TCS foods separately to reduce the amount of cooler space required for keeping those items chilled. Using individual sacks or boxes for meals may mean that multiple items are included that need to be chilled or that the convenience of having all items together was important. The largest percentage (77%) reported transporting milk in a cooler with ice or ice packs, and only 15 reported packaging the milk without ice or ice packs frequently or occasionally. Four managers reported that UHT milk (shelf stable) was frequently used for field trips, and seven reported that they used it occasionally, which would eliminate the need for cold temperature control.

Teachers (27 of 43) reported that field trip meals were frequently placed in a cardboard box, bag, or plastic tub, while 14 reported that they were packed in a cooler with ice or ice packs. Seven reported that lunches were placed in backpacks, and only four indicated that they were placed in a cooler without ice or ice packs. Almost all field trips were taken on school buses, and that was the storage site for meals reported by 19 of 38 teachers. If meals were not stored on a bus, a building with no refrigeration was the next most likely place (14 of 39). Even when field trips

are taken in the winter, food at ambient temperature may be in the temperature danger zone in a short period of time.

Table 3 presents a summary of the equipment used for transporting field trip meals. The majority (71%) reported using insulated containers for transporting cold foods, with most of those made of hard plastic. Several brands of coolers were used. Very few reported providing hot items for field trip meals.

Table 3. Equipment Used by School Nutrition Directors for Transporting Hot and Cold Foods on Field Trips (N=192)

	n	%
Use of insulated containers for transporting cold meal components		
Yes	53	71
No	22	29
Material for cold-holding containers		
Plastic	39	76
Styrofoam	4	8
Metal	1	2
Other	7	14
Cold-holding containers hard- or soft-sided		
Hard-sided	39	78
Soft-sided	9	18
Other	2	4
Brand of cold-holding containers		
Coleman™	18	38
Igloo™	10	21
Cambro™	7	15
Rubbermaid™	6	13
Other	7	15
Use of insulated containers for transporting hot meal components		
Yes	4	67
No	2	33
Material for hot-holding containers		
Plastic	3	75
Metal	0	0
Styrofoam	0	0
Other	1	25
Hot-holding containers construction		
Hard-sided	2	50
Soft-sided	2	50
Brand of hot-holding container		
Cambro™	1	25
Coleman™	1	25
Igloo™	0	0
Rubbermaid™	0	0
Other	2	50

Note: All respondents did not answer every question.

Other Food Safety Practices

Teachers reported that the use of hand sanitizers was the most common hand hygiene practice. Twenty-five teachers reported that students frequently use hand sanitizers while 12 reported that they occasionally did. Seventeen of the 42 teachers reported that students frequently washed their hands before eating, and 22 reported that occurs occasionally. Hand washing facilities may not be readily available in some field trip settings. While hand sanitizers are not as effective as hand washing and do not destroy norovirus, their use is superior to no attempts at hand hygiene. The Centers for Disease Control and Prevention (2011) recommend that hand sanitizers with at least 60% alcohol be used if soap and water are not available for hand washing, but state that sanitizer is not effective when hands are visibly dirty or greasy.

The overwhelming majority of school nutrition managers (97%) indicated that all food sent on field trips was discarded if not consumed. Most teachers (34 of 43) reported that leftovers from school-prepared meals served on field trips were discarded.

About three-fourths (72%) of school nutrition directors reported to have standard operating procedures that included guidelines for safe food handling. Fewer reported to have standard operating procedures that included directions for preparing field trip meals (66%), directions for transporting field trip meals (55%), requirements for food temperature measurements prior to meal service by a teacher or volunteer (38%), or requirements for food temperature record keeping prior to meal service by a teacher or volunteer (32%).

Nine teachers reported that they were provided with food handling guidelines or standard operating procedures for meals consumed at schools or on field trips. Nine of the 43 indicated that they had some concerns about the safety of meals served on field trips. Most of the concerns noted by teachers related to lunches not being refrigerated, and they especially mentioned their concern for milk. One teacher noted, “It doesn’t look like we even come close to considering food safety.” Eleven teachers reported that information or training related to food safety was available to them, and 11 reported that they were provided with food handling guidelines or procedures for meals served on field trips. Further, teachers reported to have three or more volunteers who help chaperone on field trips. These individuals may have limited knowledge about food safety.

School nutrition managers were asked if they have any specific concerns about food safety for meals served on field trips, and 135 (77%) responded “No”. Several questions were asked about training for teachers and volunteers. Only 21% provided any training for teachers or field trip volunteers related to food safety (Table 4). Informal face-to-face training (for example, as someone came to the school cafeteria to pick up field trip meals) was by far the type of training provided most often (77% of respondents). In addition to the barriers listed in Table 4, the perception that food safety is not a concern may influence decisions about providing training for teachers and volunteers.

Table 4. School Nutrition Managers' Reported Training for Teachers and Volunteers Related to Food Safety for Field Trip Meals (N=192)

	n	%
Food safety training for teachers and/or field trip volunteers		
No	116	79
Yes, training is required	15	10
Yes, training is optional	16	11
Type of training		
Informal face-to-face training (i.e. when someone picks up the meals)	67	77
Formal/pre-arranged training prior to field trip (face-to-face)	11	13
Education materials	8	9
Online training	3	3
Other	8	9
Barriers to implementing training		
Teachers' time	65	52
Manager's time	53	43
Foodservice employees' time	37	30
Volunteers' time	34	27
Scheduling conflicts	26	21
Cost	18	15
Resources	15	12
None	38	31
Other	7	6
Tools or resources would help overcome these barriers		
Training materials/lesson plans	10	56
Webinars/online modules	5	28
Other	5	28

Note: All respondents did not answer every question.

CONCLUSIONS AND APPLICATION

Based on reports of both school nutrition managers and school teachers, it is evident that TCS foods are included in meals provided for field trips, both those prepared by the school nutrition program and those brought from home. TCS foods that are frequently provided on field trips, especially high numbers of deli sandwiches made of turkey, ham, or other deli meats, necessitate that attention be given to cold holding. Most of the field trip meals provided by the school nutrition program are reported to be prepared on the day of the field trip, which may impact food temperatures. Simulation research is needed to determine temperatures of food prepared on the day of the field trip and food prepared a day in advance and placed in the refrigerator.

The majority of school nutrition managers reported transporting food in coolers with ice or ice packs; yet nearly 30% did not. A variety of brands and types of coolers are used but little is known about the effectiveness of these coolers in maintaining temperatures. Thus, additional

research is needed to determine the effectiveness of various scenarios (type of cooler, use of ice packs, number of meals, ambient temperature at which cooler is held) to develop best practices. Food safety for field trip meals was not reported as a concern by the majority of school nutrition managers or teachers. Only about 20% of school nutrition managers provided food safety training for teachers or volunteers, citing teachers' and managers' time as being barriers. This study did not explore whether managers had access to teachers or perceived that they would be a trusted source of information for teachers. About a fourth of the teachers reported that they did not have any food safety information or training. Research is needed to determine ways to provide teachers with appropriate information and identify trusted sources of this information.

Results of this study have applications for school nutrition directors and managers, USDA, groups such as the National Food Service Management Institute that develop educational programs, and researchers. For school nutrition personnel, this research could sensitize them about the need to focus on food safety for field trip meals and inform their decisions about field trips such as using menu items that can be maintained at appropriate temperatures, developing standard operating procedures, purchasing equipment that can keep food at the proper temperatures, and training of school nutrition staff, teachers, and volunteers about food safety.

There are several ideas for developing educational resources to support a district food safety policy evident from this study. Examples of resources that could be developed include fact sheets for school nutrition personnel, teachers, and volunteers; a model policy for field trip meals; a standard operating procedure for field trip meals; and colorful stickers with food safety messages that could be placed on foods and coolers used for field trip meals. There is a sample field trip policy from the Wisconsin Department of Public Instruction (available at fns.dpi.wi.gov/sites/default/files/imce/fns/.../fieldtrip_may2014.docx) that could be adapted by a school district.

This study is preliminary and results lead to additional research questions that could be explored. For example, what are the actual temperatures of food products from the time they leave the cafeteria until they are eaten by students? Or how well do various types of coolers maintain temperatures when they are in hot buses? Simulations are needed to identify time and temperature parameters for various food items considering equipment and varying ambient air temperatures. Microbiological studies for TCS foods based on simulations would be useful for developing standard operating procedures to promote the safety of meals served on field trips.

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