

MANAGEMENT OF FOOD ALLERGIES IN SCHOOLS

**Kevin Sauer, PhD, RDN, LD; Emily Patten, PhD, RD, CD;
Kevin Roberts, PhD; Michael Schartz, RDN**

ABSTRACT

Purpose/Objectives

The purpose of this study was to collect current baseline data about food allergy management in school districts. The guiding objectives included determining the extent of food allergy accommodations and frequency of allergic reactions in schools, in addition to assessing management strategies implemented by school nutrition programs.

Methods

The research design included an online questionnaire designed to address the research objectives. It was distributed to a randomized national sample of child nutrition program directors (n = 5,592).

Results

Participants responded to pre-screening and various conditional branching questions. Usable survey responses totaled 480. Responses represented demographic and operational diversity. Nearly all reporting school districts provided meals to students with allergies to peanuts (97%) and milk (94%), followed closely by tree nuts (77%), wheat (77%), and eggs (71%). About 79% of the school districts reported maintaining appropriate documentation for students with food allergies, with school nurses (58%) primarily responsible for maintaining said documentation. Approximately 74% of the respondents indicated that their district had a plan for managing food allergies, and of those, most (74%) indicated their plans were about 76% complete.

Applications To Child Nutrition Professionals

A school district's ability to provide allergen-free meals to children with food allergies requires attention and effective communication among many internal and external stakeholders. Food allergy management in schools is also uniquely multidisciplinary as it involves parents, school nutrition staff who prepare and serve food, school nurses who may be responsible when an allergic reaction occurs, teachers, and food manufacturers and suppliers.

Keywords: Management, Allergies, Prevalence, Policies

INTRODUCTION

Food allergies in the school nutrition environment continue to be an important food safety concern affecting approximately one in 25 school-aged children (Sicherer, Mahr, & the Section on Allergy and Immunology, 2010). Although many young children with food allergies may have received a specific diagnosis at an early age, approximately 25% may not experience their first reaction until after they enter elementary school (Leo & Clark, 2007). School administrators are encouraged to revise district and nutrition department's policies and procedures for managing food allergies directly, or consider various modifications to the physical environments and

situations where children and food allergens intersect (Centers for Disease Control and Prevention [CDC], 2013).

Considering the multi-faceted nature of food allergies, the stakeholders involved are diverse, often involving not only the children, but their medical provider(s), teachers, parents, and other school personnel (CDC, 2013; Institute of Child Nutrition [ICN], 2018; Sicherer et al., 2010). The impact of food allergies extends beyond the school cafeteria; students and food intersect throughout the school district, even in various subsystems like classrooms and school transportation vehicles (Carrol, McIntyre, Sheetz, & Young, 2005).

Children with allergies may inadvertently consume food containing life-threatening allergens during the school day, or be exposed to these same allergens through cross contact of products or ingredients at various times in the school day, particularly during breakfast, lunch, or snack periods (CDC, 2013). Eight food items are commonly associated with most allergic reactions: milk, eggs, peanuts, tree nuts, fish, shellfish, soy, and wheat (U.S Food & Drug Administration [FDA], 2017). These foods are ingredients in many food options for children or are often used in recipes or purchased food products.

School nutrition directors are, or should be, actively involved in the district's food allergy management planning (CDC, 2013; ICN, 2018; Sicherer et al., 2010). The Academy of Nutrition and Dietetics' Practice Paper regarding the role of Registered Dietitian Nutritionists in diagnosing and managing food allergies indicates a comprehensive school food allergy management plan should involve standardized systems and record-keeping (Collins, 2016). The Food and Drug Administration's Food Code (2017) requires employees be trained about food allergy awareness as it relates to their workplace responsibilities. Child nutrition staff should receive training to prepare them to adequately meet students' needs and respond to emergencies if necessary (Collins, 2016).

Effective management of food allergens in the school environment entails close supervision of food supplies, ingredient listings, and product labels (CDC, 2013). It also involves appropriate and effective communication with food vendors and suppliers (CDC, 2013). Foodservice staff, teachers, and school healthcare professionals should be prepared for emergencies and remain attentive to internal communication channels about allergies and food alternatives (CDC, 2013). School nutrition personnel, especially those in food production and service roles, benefit from specific training focused on reading food labels to identify allergens, preventing cross-contact of allergens, and preventing/responding to allergy-related emergencies (CDC, 2013; Collins, 2016). Best practices include checking food labels with each purchase to ensure ingredients have not changed, and also, maintaining food labels and current contact information of vendors and suppliers to address concerns about ingredient information (CDC, 2013).

School nutrition directors and their employees intend to provide safe and nutritious food to children. However, food allergies will continue to pose a unique challenge for schools and their nutrition programs because no cure for food allergies will likely exist in the near future, and avoidance is the key management tool (Collins, 2016; Portnoy & Shroba, 2014). When students have allergic reactions, especially severe reactions, epinephrine is typically administered (ICN, 2018; Portnoy & Schroba, 2014). Being aware of state/local laws regarding epinephrine administration (ICN, 2018) and assuring proper training of school personnel (if applicable) is key to emergency management. Food allergy management represents a critical element of a school's comprehensive food safety program.

Objectives

The purpose of this study was to collect baseline data about food allergy management in school districts across the nation. The guiding objectives were to:

1. Determine the prevalence of accommodations for food allergies in schools;
2. Ascertain the frequency of allergic reactions in school districts; and
3. Identify current food allergy management strategies used in school districts.

METHODOLOGY

This research used an online questionnaire from a national sample of school nutrition directors to gather information concerning practices about food allergies and related practices in their districts. The questionnaire was designed to address the objectives of the study.

Research Approval

Before data collection, the university's Institutional Review Board approved the research protocol. All researchers involved in the study successfully completed mandatory human subjects training.

Sample

School nutrition directors were the intended audience for this study. A sample of directors (n = 5,592) was purchased from a marketing company that maintains a national contact listing for school nutrition personnel. Researchers requested that the company provide one contact per district to assure that only one person from each district had the opportunity to complete the survey instrument. Those on the sample list were asked to complete the survey instrument if they were primarily responsible for allergy management in their districts, or to forward the instrument to the person most responsible for allergy management to complete.

Questionnaire

The initial questionnaire was informed by the available literature, and then, several individuals with expertise in either food safety, food allergies, or school nutrition reviewed the questionnaire to ensure content validity. It was then pilot-tested with a convenience sample of 20 school nutrition directors and state agency personnel. This feedback resulted in minor modifications to the final instrument. The final questionnaire included 36 items addressing the types and frequencies of food allergies and reactions, food allergy documentation and plans, operational practices and allergy controls, and demographics. Response options for questions included yes, no, not sure, or not applicable along with frequency and percentage estimates, and Likert-scale responses. Open-ended questions with text boxes were frequently included throughout the questionnaire to allow for additional comments.

The first item of the questionnaire was a screening question: "Does your district have students who require meal accommodations due to food allergies?" Participants responding in the affirmative continued with the questionnaire, while those who selected "no" did not.

Data Collection

An instructional cover letter with a survey link was emailed to the sample. The cover letter outlined the purpose of the study, study objectives, the rights of human subjects, terms of confidentiality, and contact information for the lead researcher. The online questionnaire was available electronically through Qualtrics (Provo, UT) and active for four weeks. Two follow-up reminders were provided during the four-week period of data collection. All individual responses were anonymous and confidential.

Data Analysis

The raw data set was imported into SPSS (Version 25). Surveys with less than 50% of the questions addressed were not included in the analysis. Descriptive statistics were calculated. These included frequencies, percentages, and means. The research team manually reviewed open-ended comments and identified general themes and patterns of responses.

RESULTS AND DISCUSSION

Response rate

Of the 5,592 surveys distributed, 480 individuals accessed the questionnaire. For the initial screening question “Does your district have students who require meal accommodations due to food allergies?” 422 individuals indicated “yes”, 49 indicated “no”, and nine did not respond, yielding a usable response rate of 9%. The response rate was less than desirable; however, it parallels survey attempts and response rates for the child nutrition audience in recent years, ranging from 7% to 22% (Grisamore & Roberts, 2014; Kwon, Lee, Park, Wang, & Rushing, 2017; Pratt, Bednar, & Kwon, 2012; Sneed & Patten, 2015). The lower response rate may be due to the timing of the survey. The survey was available later in the school year when dealing with food allergies may have become routine and the issue not perceived as important. Therefore, results and interpretation of these findings are not generalizable to the school nutrition population. However, results do provide a sense of current strategies in place related to management of food allergies in schools.

The initial question indicates that most respondents provide meal accommodations for food allergies. On subsequent questions, response rates varied based on the applicability of questions, conditional branching from the preceding question, or non-responses. Multiple responses generated for some questions led to varying response rates per question.

Profile of Respondents

A majority of respondents reported their job titles as directors of school nutrition programs (n=254, 74%), followed by program coordinators (n=77, 16%), supervisors (n=24, 5%), and managers (n=24, 5%). Thus, most of the sample reflects school nutrition professionals employed in a supervisory capacity. While about 30% of the programs reported employing a Registered Dietitian (RD) or Registered Dietitian Nutritionist (RDN), few survey participants identified as RD or RDN (14%), School Nutrition Specialist (14%), or a Certified Dietary Manager (6%). Finally, aside from the provided survey choices, about 66% (n=317) identified “other” credentials, such as ServSafe® certified or having another educational degree.

Student enrollment of the district was provided through open numerical input and most often between 1,000 to 50,000 students. The lowest number of respondents came from larger districts, with less than 1% reporting enrollments of 50,000 or more. Schools per district were most frequently reported as one to five schools (n=211, 44%) or six to 10 schools (n=101, 21%). Responses came from school districts in all 50 states and territories except Puerto Rico, Hawaii, Delaware, and Rhode Island. Nearly all school foodservice operations were self-operated (n=437, 91%).

Prevalence of food allergies

Table 1 summarizes the percentage of school districts providing meal accommodations for the top eight food allergens (n=387, 95%). Nearly all reporting school districts provided meals to students with allergies to peanuts (n=375, 97%) and milk (n=363, 94%), followed closely by tree nuts (n=298, 77%), wheat (n=297, 77%), and eggs (n=274, 71%). About three-fourths of the

school districts served students with soy or *other* allergies. Food accommodations noted in the “other” category included food dye, strawberry, corn, pineapple, gluten, and/or citrus (n = 94, 24.2%).

Table 1. Frequency of School Districts Providing Meals to Students with Allergies to the Top Eight Food Allergens (n=387)

	Yes	No	Unsure
Peanuts	375 (96.9)	10 (2.6)	2 (0.5)
Milk	363 (94.0)	10 (2.6)	5 (1.3)
Tree nuts	298 (77.0)	27 (7.0)	11 (2.8)
Wheat	297 (76.7)	36 (9.3)	7 (1.8)
Eggs	274 (70.8)	52 (13.4)	14 (3.6)
Soy	206 (53.2)	56 (14.5)	21 (5.4)
Fish	198 (51.2)	78 (20.2)	21 (5.1)
Shellfish	174 (45.0)	77 (19.9)	27 (7.0)
Other	94 (24.2)	22 (5.7)	14 (3.6)

Incidence of allergic reactions

One fifth of the respondents (n=96, 20%) provided information about the number of food allergy reactions that occurred during the past academic year, with a reported range of one to 10 reactions. However, some respondents also indicated they were “not sure” (n=72, 75%) if allergic reactions had occurred.

Food allergy management strategies

About 79% (n=380) of the respondents reported maintaining appropriate documentation for students with food allergies, as categorically defined in the survey instrument. School nurses (n=278, 58%) were primarily responsible for maintaining students’ allergy documentation (Table 2) with only 16% (n=77) reporting that school nutrition directors had that responsibility.

Table 2. Personnel Responsible for Maintaining Food Allergy Documentation (n=293)

	Number (%)
Registered Nurse	169 (57.7)
District Nutrition Director	48 (16.4)
Other	31 (10.6)
School Nutrition Manager	25 (8.5)
Registered Dietitian	20 (6.8)

Note. Multiple responses allowed

Approximately 74% (n=355) of the respondents indicated that their district had a plan for managing food allergies. When asked via a sliding scale, the average reported percent overall plan completeness was 76%, with a range for estimation offered from 0% to 100%. Open-ended comments suggested that having adequate time and other resources were primary challenges to having a complete, comprehensive plan for food allergies.

About 74% (n=355) of the respondents indicated they could “always” or “frequently” meet students’ severe food allergy restrictions with foods regularly purchased. Table 3 shows frequency of common operational practices used to manage food allergies in school districts.

From a given list, respondents selected all available options that applied to their districts. “Allergen-safe zones” was the most frequently reported practice implemented to help protect students with food allergies (n=187, 39%).

The questionnaire also inquired about the status of implementation of operational practices such as ingredient tracking, vendor communications, and internal communications. The most frequently reported practice was keeping ingredient records for foods served in schools in order to track allergens. Others (n=275, 57%) agreed that vendors often make substitutions without notifying school nutrition staff. Respondents also agreed (n=279, 58%) that external communication about allergies from vendors is effective and that adequate information is provided on labels for both commercial and USDA Foods to identify food allergens.

Table 3. Practices Used to Manage Food Allergies in School Districts (n=372)

	Number (%)
Allergen-safe zones on campus	187 (39.0)
Ban on specific foods on campus	75 (15.6)
Restrictions on food not included in a reimbursable meal ^a	68 (14.2)
Food-free zones on campus	42 (8.8)

Note. Respondents were able to select all that applied to their district. This figure indicates those responding in the affirmative that the policy or practice was in place.

^a Defined as foods provided outside of the USDA National School Lunch or similar programs

Table 4 provides information about five topics reported as discussed during training sessions with foodservice employees. Respondents indicated which of the listed topics was included in their district’s orientation and training program. “General food handling practices for reducing exposure to allergens” was the most frequently reported training topic, yet fewer than half of the school districts (51.3%, n=206) reported that employees had received this training.

Table 4. District Food Allergy Training Topics Provided to Foodservice Staff (n=401)

Topics	Number (%)
General food handling practices for reducing exposure to allergens	206 (51.3)
Overview of food allergies and key terms	147 (36.7)
Potentially life-threatening food allergies	125 (31.1)
Signs and symptoms of food allergy reactions	125 (31.1)
The district's or school's emergency plans for allergic reactions	110 (27.4)

Note. Respondents reported which of all listed topics were addressed in employee training for the district.

CONCLUSIONS AND APPLICATIONS

Food allergy management has important implications for consumers across all dining settings, but particularly in the school environment. School nutrition programs strive to serve healthy and

safe meals to all children, yet those with specific food needs highlights the importance of examining food allergy management best practices and barriers to achieving these.

The results of this study suggest that school nutrition programs should evaluate their operations for specific policies to manage food allergies, in addition to the consistent use of these policies. School personnel reported practicing some components of food allergy management, such as maintaining ingredient records, and conducting employee-training programs. Operationally, about 74% of the respondents reported “frequently” or “always” meeting the needs of students with severe food allergies with regularly purchased foods. This suggests that both school districts and the food industry are responding to the changing needs of students, and that those with menu planning responsibilities in schools have developed reasonable meal choices for students with allergens from foods typically ordered for the school nutrition program.

Areas of opportunity revolve around what remains unknown about food allergies in schools. For example, some respondents were “unsure” about the incidence of allergic reactions occurring in their district. It is unclear whether there are no allergic reactions, if school nutrition professionals are not part of internal communication channels, if such channels do not exist, or if there truly is unawareness about food allergy reactions occurring in school nutrition programs. Managing food allergies clearly remains a multi-disciplinary issue, which elevates the need for effective communication within the district among all stakeholders (ICN, 2018). Findings from this study showed that less than half of school nutrition employees did not receive training about food allergies. As with any standards in a school nutrition program, consistent and effective employee training methods are one way to standardize practices, and help schools manage the risks of food allergies and related reactions.

Based on findings from this study, the researchers provide the following future research and practical recommendations. Future research should systematically identify the implementation of best practices associated with food allergy management across a continuum of school district sizes, production, and foodservice parameters. A combined assessment through survey methodology and on-site observations would inform the literature about how schools have customized their food allergy management plans to meet needs of the district. Related to this, knowing more about national efforts taken, or outcomes associated with food allergies as part of a master food safety or HACCP plan, would be beneficial for those in both research and operational communities. In addition, gaining additional insights about the specifics of barriers to completing and implementing food allergy management plans would be helpful in developing ways to overcome these challenges.

Operationally, regardless of the source of food items, program directors and leaders should continue to encourage school nutrition professionals to read labels and communicate with suppliers or manufacturers directly with questions about ingredient substitutions and changes, as well as include such expectations in purchasing and receiving standard operating procedures. Directors and managers might consider orientation/training materials that provide exposure to food allergy management principles for new school nutrition professionals immediately upon hire, especially for those not familiar with the school nutrition environment. Training materials should reflect realistic and compelling issues about food allergies. As schools seek to increase program participation and reduce risks associated with food allergies, the management of food allergies is a timely research topic. This topic involves the consistent examination of sound practices not only in the nutrition program, but also throughout the school environment.

Finally, as with all research, this study is not without limitations. As mentioned, the response rate was less than desired, although it mirrors recent survey response rates from the same population (Grisamore & Roberts, 2014; Kwon, Lee, Park, Wang, & Rushing, 2017; Pratt, Bednar, & Kwon, 2012; Sneed & Patten, 2015). Therefore, the results of this study are not generalizable to the population of school nutrition programs. Financial or other gift incentives, more reminders, or other cues may have yielded a higher response rate. Given the extensive conditional branching used for some questions to improve response specificity, some missing data is expected. Non-response bias due to various factors such as survey length, timing of delivery, or other factors are common features of survey methodologies. While non-response bias did not appear to alter the application of the findings, it is difficult to infer about the opinions of those who did receive the survey, yet chose not to respond. Finally, given the servant nature of school nutrition, the quest to protect children, and sensitive nature of food allergies in schools, some study participants may have provided responses deemed more socially desirable, hopefully to illustrate anticipated practices versus real practices. Regardless of the low response rate, the findings provide current insights about management practices of food allergies in schools.

REFERENCES

- Carroll, C. R., McIntyre, C. L., Sheetz, A. H., & Young, M. C. (2005). Administration of epinephrine for life-threatening allergic reactions in school settings. *Pediatrics, 116*, 1134-1140. doi: 10.1542/peds.2004-1475
- Centers for Disease Control and Prevention. (2013). *Voluntary guidelines for managing food allergies in schools and early care and education programs*. Washington, DC: US Department of Health and Human Services.
https://www.cdc.gov/healthyyouth/foodallergies/pdf/13_243135_A_Food_Allergy_Web_508.pdf
- Collins, S. C. (2016). Practice Paper of the Academy of Nutrition and Dietetics: Role of the Registered Dietitian Nutritionist in the diagnosis and management of food allergies. *Journal of the Academy of Nutrition and Dietetics, 116*, 1621-1631.
<https://doi.org/10.1016/j.jand.2016.07.018>
- FDA (Food and Drug Administration). Food Code. (2017).
<https://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm595139.htm>
- Grisamore, A., & Roberts, K. R. (2014). Food recall attitudes and behaviors of school nutrition directors. *Journal of Child Nutrition & Management, 38*(2).
<https://schoolnutrition.org/jcnm/>
- Institute of Child Nutrition. (2018). Food allergies for school nutrition directors. University, MS: Author. <http://www.theicn.org/ResourceOverview.aspx?ID=507>
- Kwon, J., Lee, Y. M., Park, E., Wang, Y., & Rushing, K. (2017). Free and Reduced-Price Meal Application and Income Verification Practices in School Nutrition Programs in the United States. *Journal of Child Nutrition & Management, 41*(1). <https://schoolnutrition.org/jcnm/>
- Leo, H., & Clark, N. (2007). Managing children with food allergies in childcare and school. *Current Allergy and Asthma Reports, 7*(3), 187-191. doi: 10.1007/s11882-007-0020-4
- Pratt, P., Bednar, C., & Kwon, J. (2012). School nutrition directors' perceptions of technology use in School Nutrition Programs. *Journal of Child Nutrition & Management, 36*(2).
<https://schoolnutrition.org/jcnm/>

- Portnoy, J. M., & Shroba, J. (2014). Managing food allergies in schools. *Current Allergy and Asthma Reports*, 14(10), 467. doi: 10.1007/s11882-014-0467-z
- Sicherer, S.H., Mahr, T., & The Section on Allergy and Immunology. (2010). Clinical Report - Management of Food Allergy in the School Setting. *Pediatrics*, 126(6), 1232-1239. doi: 10.1542/peds.2010-2575
- Sneed, J., & Patten, E. V. (2015). Current Practices for Providing School Field Trip Meals: Perspectives of School Nutrition Managers and Teachers. *Journal of Child Nutrition & Management*, 39(1). <https://schoolnutrition.org/jcnm/>
- United States Department of Agriculture, Food and Nutrition Service. (2001). *Accommodating students with special dietary needs in the School Nutrition Programs*. Retrieved from http://www.fns.usda.gov/cnd/guidance/special_dietary_needs.pdf
- U.S. Food & Drug Administration. (2017). *Food allergies: What you need to know*. Retrieved from <https://www.fda.gov/food/resourcesforyou/consumers/ucm079311.htm>

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BIOGRAPHY

Kevin Sauer is an Associate Professor of Food, Nutrition, Dietetics, and Health at Kansas State University in Manhattan, Kansas. Emily Patten is an Assistant Professor of Nutrition, Dietetics & Food Science at Brigham Young University in Provo, Utah. Kevin Roberts is Associate Professor in Hospitality Management at Kansas State University. Michael Schartz is an Operations Manager for the Nutritional Services Department in the Kansas City Public Schools.