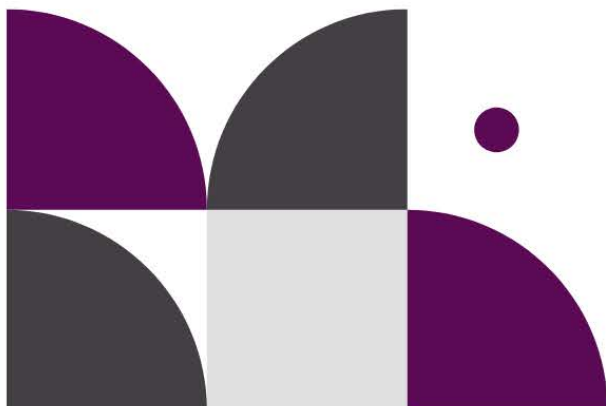




Journal

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EDITOR'S NOTE

Welcome to the Fall 2025 Issue of the *Journal of Child Nutrition & Management* (JCNM)!

Please consider submitting manuscripts to the Journal to further the dissemination of research and other relevant information in our field. Articles can be submitted in one of the following categories: 1) Commentary, 2) Current Issues, 3) Practical Solutions, 4) Research in Action, or 5) Research Briefs. Information on JCNM contribution and reprint guidelines can be found at the following [link](#).

RECOGNITION OF REVIEWERS

Thank you to the peer-review team that contributed to this issue. Your contributions are invaluable! Please consider supporting the efforts of the *Journal of Childhood Nutrition & Management* by serving as a reviewer or nominating a colleague. For more information, please do not hesitate to contact: Keith.rushing@usm.edu.

IN THIS ISSUE

There are two Research in Action (RIA) articles, one Research Brief article, and one Practical Solutions article. In the first RIA article, researchers investigated the food trends of K–12 schools participating in the School Breakfast Program. For the second RIA article, researchers assessed the training needs of cafeteria managers in Virginia. The research brief article discussed trends in meat/meat alternates in middle school menus. In the practical solutions article, researchers discussed the evaluation of a national food safety initiative. In the Additional Content section, representatives from USDA Food and Nutrition Services provided an update of ongoing research, and the Applied Research Division of the Institute of Child Nutrition provided a research update.

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Food Trends of K–12 Schools Participating in the School Breakfast Program

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KEYWORDS: Food trends, school meal programs, school nutrition, school breakfast, preferences, students

INTRODUCTION:

The United States Department of Agriculture's (USDA) School Breakfast Program (SBP) is a pivotal federal initiative designed to provide nutritious morning meals to school children nationwide. Currently, the SBP serves approximately fifteen million students daily, positioning it as one of the most extensive Child Nutrition Programs in the United States (USDA, 2020). The SBP meal pattern includes fruits and vegetables, whole grains or meats/meat alternates, and fluid milk, adhering to calorie, fat, and sodium limits to support children's health (School Breakfast Program Meal Pattern, 2024). The program emphasizes nutrient-rich foods, such as whole fruits instead of juice and whole grains rather than refined grains (Updates to the School Nutrition Standards, 2025).

Recent updates to the SBP aim to reduce childhood illnesses, increase access to healthy foods, improve academic outcomes, and align meal patterns and regulations more closely with the latest Dietary Guidelines for Americans (DGA) guidance (Updates to the School Nutrition Standards, 2025). These changes include reductions in added sugars and sodium and added flexibility in some areas, including meat/meat alternates, vegetables, and nuts and seeds (USDA Food and Nutrition Service, 2024).

Breakfast consumption has been shown to improve cognitive function, memory, and mood—critical elements for a productive school day (Brown et al., 2008; Lundqvist, Vogel, & Levin, 2019; Wenes et al., 2012). Research indicates that children who consume healthy breakfasts are more attentive in class, perform better on achievement and standardized tests, and experience fewer disciplinary problems (Brown et al., 2008; Imberman & Kugler, 2014; Ptomey et al., 2016). Because of this, one could conclude that hungry students are at a disadvantage as compared to their well-fed peers, making a consistent and accessible SBP a vital component in providing equal educational opportunities.

Despite its widespread acclaim, the SBP faces several challenges. Participation rates for the SBP can be lower than those of the National School Lunch Program (NSLP), even though both programs follow similar federal regulations and are operated in the same facility with the same staff (Spruance et al., 2023). One cause of lower participation in the SBP is related to parental perceptions. In a study conducted by Spruance and colleagues (2023), 62% of adult respondents to an electronic survey distributed across the state of Utah have children who have never participated in the SBP. When asked about their perceptions of school breakfast, study participants believed that a home-prepared breakfast was healthier than a school breakfast. Furthermore, there were two



primary predictors for decreased perceptions of school breakfast among study participants, which could influence student participation in the SBP: a) never participating in school breakfast and b) parental perceptions of school breakfast components, including fruit and whole grains (Spruance et al., 2023). In addition to parental perceptions, student perceptions of school breakfast, getting to school in time for breakfast service, and socioeconomical stigmas around school meal consumption can be related to low SBP participation rates (Askelson et al., 2017; Doughty et al., 2020; Lambert et al., 2007). Another criticism pertains to food waste. Although nutrition standards have improved, critics argue that student preferences and the perishability of foods like milk and fruit result in foods being discarded and not consumed by student SBP participants (Blondin et al., 2015; Folta et al., 2016; Fox et al., 2019). Schools have attempted to address these issues by implementing Grab-and-Go options, utilizing breakfast kiosks, serving breakfast in the classroom, and operating other service models to make breakfast more accessible, reducing negative connotations associated with school breakfast, and increasing student acceptability (Folta et al., 2016; Larson et al., 2019; Morris et al., 2010).

Over the past decade, key factors have influenced food trends in K–12. Policy changes, such as the Healthy, Hunger-Free Kids Act (2010) and the Final Rule – Child Nutrition Programs: Meal Patterns Consistent with the 2020–2025 Dietary Guidelines for Americans (2024), have established additional nutritional standards to improve school meal quality. Concurrently, shifting student preferences and the integration of local, regional, and traditional foods have shaped the types of foods desired or offered in school meal programs (Bastami, et al., 2019; Cohen et al., 2021; Simplot, 2023; Smith et al., 2019).

Popular foodservice companies and national associations are reporting on popular menu items and menu trends in the US. For example, foodservice companies that operate school meal programs report annually on popular menu items among the students they serve (Chartwells, n.d.; Gingerella, 2023; Simplot, 2022; Simplot, 2023). Additionally, organizations such as the National Restaurant Association conduct research with culinary industry professionals to identify top and emerging menu trends annually (National Restaurant Association, 2024). However, no research to date has exclusively assessed food trends among K–12 students participating in the National School Lunch Program (NSLP) or SBP on a national level, utilizing NSLP and SBP professionals. Understanding these evolving preferences and consumption patterns is essential for school nutrition professionals, policymakers, and industry professionals seeking to meet nutrition standards for school meals and increase student participation. Therefore, this study aimed to provide valuable insights into the current landscape of food trends in school meal programs across the country by identifying foods that are currently popular and fading in popularity, with breakfast being the focus of this article.

METHODOLOGY:

Study Design and Participants

The Institute of Child Nutrition (ICN) Applied Research Division conducted a national online survey titled "Food Trends in K–12" in April 2024. This survey aimed to assess current and emerging food trends and preferences within K–12 school nutrition programs across the United States, gathering insights from various school nutrition professionals, including directors, managers, staff, chefs, and state agency professionals. Individuals who work with the school meal program were recruited using a convenience sampling approach through social media accounts associated with the ICN, the ICN's official website, and direct email invitations. The initial sample consisted of 2,848 participants recruited via email through a national database of school nutrition professionals.

Eligibility Criteria

Eligibility to participate in this study was based on several factors: a) a self-identified knowledge of food trends in K–12 environments, b) participation in the National School Lunch and School Breakfast Programs, and c) a job title that allowed the respondent to have an active awareness of student food choices. While the NSLP and SBP are available to public and non-profit private schools, our research did not require schools to declare this specific designation. Instead, only schools that met the established research criteria were included in the study. Participants were screened based on job titles to ensure relevance to school nutrition programs. Only those identifying as "School Nutrition Director," "School Nutrition Manager/Supervisor," "School Nutrition Staff," "School Chef," or "State Agency Professional" proceeded with the survey. Respondents who selected roles outside of direct school nutrition operations, such as "School Nutrition Industry Professional," "USDA Representative," "Regional USDA Representative," or "Other," were thanked for their interest but informed they did not qualify for this survey. The eligibility question served as the first item in the survey, and participants had to respond to the question in order to proceed. Following this screening, a total of 1,691 participants met the eligibility criteria, provided job titles, and responded to at least the first survey question.

Survey Content and Data Collection

The initial phase of the study involved the recruitment of subject matter experts (SMEs) to establish foundational insight into popular food trends in K–12 settings. These experts were comprised of K–12 school foodservice directors, industry representatives, and state agency professionals with expertise in areas such as food sales data, common menu items, and menuing frequency. The insights gathered from the SMEs, current literature, and data from foodservice companies serving K–12 schools were utilized to refine and finalize the food trends survey instrument (including popular K–12 foods included in the survey). The final draft of the survey contained six sections (including a demographic section) and twenty-six questions; however, this manuscript focuses exclusively on participant demographics and the Breakfast Trends section. In the Breakfast Trends section, participants were asked to identify breakfast foods that were (1) currently popular and (2) growing in popularity in their school nutrition programs. It is important to know here that participants were not provided with pre-determined definitions for the terms "currently popular" and "growing in popularity." The

participants' interpretations of these terms were left to their personal understanding, the question block descriptions, and the broader survey context.

Response options for the Breakfast Trends section included Breakfast Smoothie, Breakfast Burrito, Breakfast Bowl, Sausage, Egg, and Cheese Biscuit, Grits, Oatmeal, Cream of Wheat, Donuts or Mini Donuts, Sausage Biscuit, Chicken Biscuit, Cereal, Breakfast Pizza, Muffins, and Yogurt Parfait. Additionally, there is an option for "Other" where respondents could specify different items not listed. Participants were allowed to select all items that applied. To present a focused analysis, the tables in this manuscript display only the top two quintiles (40%) of responses for each breakfast item category. The broader survey also included sections covering Lunch Trends, Flavors, Seasonings and Condiments, Dining Options, Assessment Methods, and Demographic Information. However, these sections will be analyzed in future publications to provide a comprehensive view of K–12 school food trends across multiple mealtimes and flavor categories.

Data Analysis

Data analysis in this manuscript focused on descriptive statistics for participant demographics and responses within the Breakfast Trends section. Responses to breakfast items were analyzed to determine the frequency and percentage of foods currently popular and emerging in popularity, with results analyzed by job title, educational setting, district size, and regional location. Due to the multiple-selection format of the questions, response percentages did not rise to 100% due to the non-exclusive nature of participants' responses. Additionally, the survey design intentionally presented the same food options for both 'currently popular' and 'growing in popular' foods. This was done to avoid any apriori distinction between these two aspects of a food's presence on a school's menu and student preferences.

Institutional Review Board Approval

The University of Southern Mississippi's Institutional Review Board approved the research activities, and participants gave written consent.

RESULTS AND DISCUSSION:

The Food Trends in K–12 survey, conducted in April 2024 by the ICN Applied Research Division, gathered responses from 1,691 school nutrition professionals across the United States, including directors, managers, staff, chefs, and state agency professionals. The analysis of breakfast items revealed that cereal (63.7%), muffins (52.7%), and donuts or mini donuts (49.7%) are the most popular items currently served. These options, known for their convenience and familiarity, cater to a range of student preferences. Additional items, such as yogurt parfaits (40.2%), breakfast pizza (39.4%), and sausage biscuits (38.5%), also rank high in popularity. These trends might reflect a balance between traditional favorites and protein-rich choices and the influence of the popular grab-and-go menu service option in schools. Growing in popularity, yogurt parfaits (30.9%) and breakfast smoothies (20.1%) suggest an increased demand for perceived healthier options, likely driven by broader trends in health-conscious eating. The idea of "healthier" options for breakfast has been identified in another research study. Doughty and colleagues (2020) conducted focus group discussions with students in



grades 1–12 on school breakfast participation and consumption habits. The results of the study indicated that the reason some students in all age groups report not participating in the SBP is related to a perception that the school food is unhealthy or junk food. When these students were asked about ways to improve school breakfast, they indicated the need for more variety in fruits, breads, and beverages, and they prioritized the need for healthier options and freshly made, real foods (Daughty et al., 2020). There may be some differences in the way different age groups approach decision making about what they select and eat. While younger students may rely more on parental influence or familiarity, older students (particularly in grades 9–12) are increasingly influenced by social norms, personal health goals, and exposure to food trends via social media (FOODBYTES, 2023; Waddingham et al., 2018). These generational and developmental differences may partially explain the rising popularity of nutrient-dense, customizable breakfast items.

Table 1. *Study Characteristics of Survey Participants*

Characteristics	Count	%
Participants Job Titles		
School nutrition manager/supervisor	707	41.80%
School nutrition director	570	33.70%
School nutrition staff	317	18.70%
School nutrition chef	71	4.20%
State agency professional	26	1.50%
Regions^a		
Mid Atlantic	107	6.3%
Midwest	230	13.6%
Mountain Plains	115	6.8%
Northeast	103	6.1%
Southeast	288	17.0%
Southwest	329	19.5%
Western	128	7.6%
Missing	391	23.1%
District Size		
Small district - < 2,500 students	974	57.6%
Medium district - 2,500 to 30,000 students	269	15.9%
Large district – more than 30,000 students	57	3.4%
Missing	392	23.2%

(Table 1 continues)

Table 1 (continued). *Study Characteristics of Survey Participants*

Characteristics	Count	%
Participants Educational Setting		
K–12 (all schools)	703	41.6%
Elementary school	401	23.7%
Middle school	236	14.0%
High school	181	10.7%
Missing	170	10.0%
Breakfast Item Popularity Trends in School Nutrition Programs		
A. Currently Popular Breakfast Items		
Cereal	1077	63.7%
Muffins	891	52.7%
Donuts or mini donuts	841	49.7%
Yogurt parfait	680	40.2%
Breakfast pizza	667	39.4%
Sausage biscuit	651	38.5%
B. Growing in Popularity Breakfast Items		
Yogurt parfait	523	30.9%
Muffins	358	21.2%
Breakfast smoothie	340	20.1%
Donuts or mini donuts	327	19.3%
Breakfast pizza	312	18.5%
Sausage, egg, and cheese biscuit	279	16.5%

Note. *The table includes participant job titles, district size, school type, and USDA regional representation.*

^aRegions are based on USDA Food and Nutrition Service designations (USDA FNS, 2024). Mid-Atlantic = Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia; Midwest = Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin; Mountain Plains = Colorado, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming; Northeast = Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont; Southeast = Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Southwest = Arizona, Arkansas, Louisiana, New Mexico, Oklahoma, Texas, and Utah; Western = Alaska, California, Hawaii, Idaho, Nevada, Oregon, Washington, Guam, Northern Mariana Islands, and American Samoa

Regional variations in breakfast preferences reveal interesting patterns, which show the importance of tailoring menu items to meet local demands. For example, while cereal maintains broad appeal, it is most popular in the Southwest (20.5%) and Southeast (17.1%). This pattern might suggest a stronger preference for traditional breakfast foods in these regions. Sausage biscuits, a Southern staple, were most popular in the Southeast (32.4%) and Southwest (24.4%). At the same time, yogurt parfaits, indicative of a health trend, demonstrated robust growth in popularity in both the Midwest (15.7%) and the Southeast (18.7%). This highlights the potential benefit of regional menu customization to optimize satisfaction and participation in school nutrition programs. (See Table 2.)

Table 2. *Regional Variations in Breakfast Item Popularity*

	Mid Atlantic		Midwest		Mountain Plains		Northeast		Southeast		Southwest		Western	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
A. Currently Popular Breakfast Items														
Cereal	75	7.0%	146	13.6%	57	5.3%	67	6.2%	184	17.1%	221	20.5%	90	8.4%
Muffins	61	6.8%	135	15.2%	61	6.8%	72	8.1%	127	14.3%	167	18.7%	76	8.5%
Donuts or mini donuts	57	6.8%	147	17.5%	62	7.4%	58	6.9%	148	17.6%	164	19.5%	47	5.6%
Yogurt parfait	34	5.0%	105	15.4%	48	7.1%	59	8.7%	102	15.0%	126	18.5%	75	11.0%
Breakfast pizza	36	5.4%	98	14.7%	57	8.5%	32	4.8%	112	16.8%	166	24.9%	40	6.0%
Sausage biscuit	25	3.8%	48	7.4%	35	5.4%	12	1.8%	211	32.4%	159	24.4%	32	4.9%

B. Growing in Popularity Breakfast Items														
Yogurt parfait	31	5.9%	82	15.7%	31	5.9%	32	6.1%	98	18.7%	98	18.7%	42	8.0%
Muffins	22	6.1%	55	15.4%	25	7.0%	23	6.4%	62	17.3%	69	19.3%	30	8.4%
Breakfast smoothie	29	8.5%	57	16.8%	14	4.1%	31	9.1%	41	12.1%	67	19.7%	35	10.3%
Donuts or mini donuts	20	6.1%	45	13.8%	22	6.7%	15	4.6%	71	21.7%	70	21.4%	19	5.8%
Breakfast pizza	12	3.8%	43	13.8%	25	8.0%	19	6.1%	54	17.3%	84	26.9%	19	6.1%
Sausage, egg, and cheese biscuit	13	4.7%	45	16.1%	17	6.1%	19	6.8%	57	20.4%	45	16.1%	29	10.4%

Note. The table shows frequency and percentage of currently popular and emerging breakfast items across USDA regions.

Breakfast item preferences also varied based on participants' job roles, school type, and district size, pointing to a specific perspective of student needs and trends within these demographics. School nutrition managers and directors, who directly oversee menu planning, nutrition compliance, and school cafeteria management, indicated traditional options like cereal (42.4%) and muffins (41.9%) as most popular among students. School chefs, however, indicated an identified student interest in newer options, with 5.2% favoring yogurt parfaits and 5.3% showing a preference for breakfast smoothies, aligning with a trend toward fresher, nutrient-dense choices. (See Tables 3 and 4.)

Table 3. *Breakfast Item Popularity by Participant Job Role*

	School Nutrition Chef		School Nutrition Director		School Nutrition Manager/Supervisor		School Nutrition Staff		State Agency Professional	
	Count	%	Count	%	Count	%	Count	%	Count	%
A. Currently Popular Breakfast Items										
Cereal	42	3.9%	378	35.1%	457	42.4%	182	16.9%	18	1.7%
Muffins	36	4.0%	331	37.1%	373	41.9%	139	15.6%	12	1.3%
Donuts or mini donuts	25	3.0%	332	39.5%	337	40.1%	135	16.1%	12	1.4%
Yogurt parfait	28	4.1%	292	42.9%	260	38.2%	89	13.1%	11	1.6%
Breakfast pizza	22	3.3%	271	40.6%	257	38.5%	103	15.4%	14	2.1%
Sausage biscuit	24	3.7%	242	37.2%	278	42.7%	97	14.9%	10	1.5%
B. Growing in Popularity Breakfast Items										
Yogurt parfait	27	5.2%	197	37.7%	204	39.0%	82	15.7%	13	2.5%
Muffins	16	4.5%	80	22.3%	175	48.9%	83	23.2%	4	1.1%
Breakfast smoothie	18	5.3%	146	42.9%	116	34.1%	52	15.3%	8	2.4%
Donuts or mini donuts	14	4.3%	89	27.2%	154	47.1%	67	20.5%	3	0.9%
Breakfast pizza	14	4.5%	93	29.8%	132	42.3%	66	21.2%	7	2.2%
Sausage, egg, and cheese biscuit	10	3.6%	109	39.1%	108	38.7%	49	17.6%	3	1.1%

Note. The table compares responses for currently popular and growing breakfast items across school nutrition roles

Table 4. *Breakfast Item Popularity by School Type*

	Elementary School		Middle School		High School		K–12 (All Schools)	
	Count	%	Count	%	Count	%	Count	%
A. Currently Popular Breakfast Items								
Cereal	278	25.8%	144	13.4%	96	8.9%	463	43.0%
Muffins	194	21.8%	127	14.3%	83	9.3%	411	46.1%
Donuts or mini donuts	195	23.2%	121	14.4%	96	11.4%	378	44.9%
Yogurt parfait	136	20.0%	90	13.2%	83	12.2%	330	48.5%
Breakfast pizza	142	21.3%	87	13.0%	79	11.8%	338	50.7%
Sausage biscuit	153	23.5%	93	14.3%	77	11.8%	297	45.6%
B. Growing in Popularity Breakfast Items								
Yogurt parfait	109	20.8%	73	14.0%	65	12.4%	242	46.3%
Muffins	111	31.0%	63	17.6%	39	10.9%	136	38.0%
Breakfast smoothie	58	17.1%	30	8.8%	41	12.1%	178	52.4%
Donuts or mini donuts	75	22.9%	53	16.2%	42	12.8%	129	39.4%
Breakfast pizza	90	28.8%	49	15.7%	36	11.5%	139	44.6%
Sausage, egg, and cheese biscuit	55	19.7%	34	12.2%	41	14.7%	137	49.1%

Note. The table breaks down food trends by elementary, middle, high school, and K–12 settings.

In analyzing the popularity of breakfast items among school districts of varying sizes (not shown in the table), distinct patterns emerge based on district size. District sizes in this study were categorized as small (under 2,500 students), medium (2,500 – 30,000 students), and large (over 30,000 students). For the currently popular breakfast items, in small districts, traditional and ready-to-serve items dominated. Cereal was the most popular choice, selected by 624 participants, representing 74.3% of the total responses for this item across all district sizes. This is followed by muffins, which were chosen by 515 participants (making up 73.7%), donuts or mini donuts (498; 72.9%), and breakfast pizza (406; 75.0%). Other common options included sausage biscuit (372; 71.3%) and yogurt parfait (380; 69.2%). This may involve underlying factors, including (a) traditional breakfast options are more feasible and widely accepted in smaller settings, (b) some school kitchens may lack the necessary equipment to prepare more complex dishes, and (c) the skill levels of kitchen staff may be limited.

In medium districts, although only comprising 15.9% of total participants, a diverse set of preferences emerged. Donuts or mini donuts were selected by (159;23.3%) participants. This indicates a continued selection of these items but with slightly different preferences compared to smaller districts. Sausage biscuits were also popular, selected by 121 participants (23.2%), while cereal remained a stable choice with 173 participants (20.6%). Muffins and breakfast pizzas received 155 (22.2%) and 114 (21.1%) selections, respectively.

In large districts that comprised 3.4% of participants, sausage biscuits were the most popular, chosen by 29 participants (5.6%), showing the highest percentage for this district size. Cereal was selected by 43 participants (5.1%), maintaining a consistent presence. Yogurt parfait followed with 27 selections (4.9%). Muffins, donuts or mini donuts, and breakfast pizza showed the least preference, with 29 (4.1%), 26 (3.8%), and 21 (3.9%) selections, respectively.

In the analysis of items growing in popularity across school districts, distinct trends emerge that suggest a shift towards trendy healthy foods and more varied breakfast options. In small districts, which housed most participants, yogurt parfait was popular, selected by 293 participants (70.8%), indicating a shift towards trendy, healthy food choices. Muffins also continued to rise in preference, with 243 participants representing an 85.0% preference rate, the highest among emerging items. Donuts or mini donuts and breakfast pizza maintain their appeal, with 208 (79.4%) and 203 (79.3%) participants, respectively, showing continuous interest. Sausage, egg, and cheese biscuits, and breakfast smoothies also showed growing preference, with 174 (77.3%) and 173 (63.1%) participants choosing them, respectively. In medium-sized districts, Breakfast Smoothies were chosen by 82 participants (29.9%), reflecting a trend towards diverse and nutritious options. Yogurt parfaits remained a strong choice, with 95 selections (22.9%), while muffins and donuts showed moderate growth. In the largest districts, despite the smaller participant pool, breakfast smoothies and yogurt parfaits were popular, with 19 (6.9%) and 26 (6.3%) participants opting for these, pointing to an emerging preference for trendy, healthier breakfast alternatives.

These findings of breakfast preferences across job roles, school types, and district sizes can guide tailored menu development. The study findings are important as they help direct resources to ensure that school nutrition programs are responsive to diverse stakeholder needs and regional demands.

The patterns observed in the Food Trends in K–12 survey conducted by the Institute of Child Nutrition Applied Research Division offer a unique perspective on regional and demographic variations. According to a study by Long et al. (2004), convenience remains a crucial factor for breakfast selection in schools, which aligns with the high popularity of cereals and muffins noted in our survey (Long et al., 2004). The popularity of traditional breakfast items such as cereal and muffins in our survey is supported by findings from Frisvold (2015), who studied the effects of serving breakfast in classrooms and noted that easily served and eaten foods like cereal are more likely to be adopted (Frisvold, 2015). The growing preference for healthier breakfast options observed in this study, such as yogurt parfaits and breakfast smoothies, aligns with USDA findings. A 2019 USDA report examined how updated nutrition standards have shaped school breakfast offerings, and another USDA publication (n.d.) further supports the increasing inclusion of nutrient-dense items in school menus.



There is limited academic research available to assess food trends in school meal programs like the SBP. Private companies, such as K–12 food management companies, food and agriculture companies, and market research companies, have provided a glimpse into food trends in school-aged children through corporate research. This data from these organizations provides a look at food trends among kids and students in K–12 settings from two perspectives – food sales and customer preferences.

Results of corporate research indicate that one of the primary factors influencing student food choices is associated with exposure to a variety of food options by their parents (Datassentials, n.d.-a; FOODBYTES, 2023). FOODBYTES (2023), a publication of an online marketing research group, surveyed parents of children born between 2010 and 2024 (which would include children between the ages of 5 and 15) and determined that 68% of the parents of children in this age group took their kids out to eat up to two times per week. Over half (52%) of this same group of parents acknowledge allowing their children to select their meals when visiting restaurants (FOODBYTES, 2023). Additionally, 56% of the parents of children born between 2010 and 2025 indicated that they purchase food seen on television or online for their children to consume (Datassentials, n.d.-a). Because of this, some students currently served in school foodservice settings are savvy eaters.

Another factor influencing student food choices is access to social media. It has been established in academic research that food advertising influences eating behaviors in children, and the Internet is a primary platform for marketing (Buchanan et al., 2018; Coates et al., 2019; World Health Organization, 2016). FOODBYTES (2023) identified that 79% of people born between 1997 and 2012 (which would include those between the ages of 13–18 years) tried food or flavors based on recipes they have seen on social media, and more than 20% of parents for children born between 2010 and 2024 (which would include children between the ages of 5 and 15 years) indicated that they allow their children to use social media platforms such as Instagram, Facebook, and TikTok. The experiences and exposure to new food trends through lived experiences and social media can expand students' expectations of meals served at home, in local restaurants, and at the local school meals program. This provides a perfect opportunity for school foodservice directors and menu planners to leverage the information on what is popular on social media and in local and chain restaurants, and the findings of the current research to build menus that would encourage participation in the SBP.

The limited academic research on food trends among children, particularly those in the SBP, highlights a gap in understanding this segment of school nutrition. Most existing data focuses on lunch rather than breakfast menus. When breakfast options were addressed, prevailing trends emerged, including mini-sized pancakes and waffles, smoothies and smoothie bowls, breakfast sandwiches, and egg dishes (Chartwells, 2024; Simplot, 2022; Simplot, 2023). The current study identified similar preferences among the survey population, with smoothies and sausage biscuit breakfast sandwiches emerging as popular choices. These results reflect broader trends observed in the foodservice industry, suggesting an increasing demand for convenient, flavorful, and familiar breakfast options. This alignment with industry trends underscores the potential for evolving breakfast menus in schools.

CONCLUSIONS AND APPLICATION:

This research marks a pioneering effort to identify food trends in K–12 schools by engaging school nutrition professionals responsible for the operation and administration of school meal programs. The insights gathered through this study have far-reaching implications for designing targeted school breakfast menus that could potentially enhance student participation in the SBP, promote menu items that align with student preferences, and mitigate food waste by offering menu options that are more appealing to students.

Increasing Participation in the School Breakfast Program

Social Acceptability

A critical factor influencing children's food choices is social acceptability, which includes peer influence and the popularity of specific foods. Studies have long shown that children's food preferences are shaped by taste and the perceived popularity of food items among their peers (Bazillier et al., 2011; Bevelander et al., 2013; Waddingham et al., 2018). Waddingham et al. (2018) conducted research highlighting the role of social acceptability in food selection among children. In this context, social acceptability refers to food choices perceived as popular among peers. In their study, children indicated that their menu selections were often influenced by what was "popular and everyone likes" (Waddingham et al., 2018), underscoring the importance of peer influence in shaping food choices. While social acceptability is not the sole determinant of food choices, it is an influential factor that can be leveraged to engage students in the SBP. Leveraging the concept of social acceptability could prove pivotal in designing breakfast menus that appeal to students and increase participation in the SBP. Given that children are exposed to a wide range of food offerings outside of school, including restaurant menus and social media trends (FOODBYTES, 2023), schools could consider aligning their menus with food items that reflect current trends while meeting nutritional guidelines. The current study's findings suggest that when students are presented with menu options that resonate with their tastes and are popular among peer groups, they may be more inclined to participate in the program.

A practical approach to aligning school breakfast menus with more popular food items could include conducting regular surveys or focus groups involving students to identify emerging trends and preferences. By actively involving students in the menu development process, school nutrition professionals can tailor their offerings to reflect the interests of their student body.

Addressing Student Preferences

Student preferences play a significant role in determining the success of school meal programs, particularly regarding breakfast options. While student preference can also resemble social acceptability from peers, research shows that children's food preferences are influenced by a combination of factors, including taste, texture, appearance, and familiarity with the item (Murimi M.S. et al., 2016; Neumark-Sztainer et al., 1999; Waddingham et al., 2018). Waddingham et al. (2018) and Murimi et al. (2016) identified that satisfaction and enjoyment are centered around taste preference among children of all ages. Student in the Murimi et al. (2016) study indicated that an important deciding factor for choosing a food was based on its taste. Doughty and

colleagues (2020) found that students in grades one through twelve preferred breakfast foods that were of “high quality”, cooked, and freshly made.

The present study identifies breakfast items students favor, including smoothies and sausage biscuit breakfast sandwiches. These foods are consistent with broader foodservice industry trends emphasizing convenience, flavor, and portability (Simplot, 2023). Such foods have gained popularity in the restaurant industry due to the growing demand for breakfast-on-the-go options (Simplot, 2022).

In the evolving present, children’s exposure to food trends, particularly through social media platforms, shapes their familiarity with various foods and fosters a desire for visually appealing, trendy options (FOODBYTES, 2023). A perfect example of this would be the smoothie bowls, which have gained traction in the social media food culture. The smoothie bowl is a prime example of a food trend that can be incorporated into school breakfast menus.

To ensure that school menus are aligned with student preferences, school nutrition professionals could use this food trends study to incorporate popular food items on breakfast menus. Given the influence of external food trends on student preferences, school nutrition programs should maintain flexibility in their menus to accommodate these evolving tastes.

Decreasing Food Waste

Food waste is a significant challenge in many school meal programs, and it represents both an economic and environmental concern. According to the School Nutrition and Meal Cost Study (Fox et al., 2019), a substantial amount of food is discarded in the SBP, with milk, fruits, and 100% fruit juice being the most wasted items. Reducing food waste should be a priority in efforts to improve the sustainability of school meal programs, and part of the solution may lie in offering menu options that better align with students' preferences.

The current study suggests that certain breakfast items are particularly popular among students, and these preferences appear to vary based on the USDA Food and Nutrition Service region and students’ age or grade level; offering these favored items in the SBP may help reduce food waste. By introducing more popular, trendy menu items, schools may encourage greater participation and reduce the likelihood that food will be discarded. For instance, offering smoothies or yogurt parfaits made with fruits students prefer or incorporating familiar breakfast sandwiches could increase the likelihood that students will finish their meals, ensuring more meals are eaten and not discarded.

Limitations of the Study and Future Research

While this research provides valuable insights into food trends within the context of the SBP, several limitations should be considered. The study primarily focuses on the perspectives of school nutrition personnel, and as such, the findings reflect their understanding of student preferences rather than the actual preferences of students themselves. While school nutrition professionals may have insights into popular food items, the researchers did not collect point-of-sale data or data on student food preferences or consumption patterns



directly from the students. Secondly, the survey questions allowed participants to select multiple responses for each item, resulting in non-mutually exclusive data. This response format limited the applicability of advanced statistical analyses, such as regression modeling, which typically require mutually exclusive outcome categories or continuous variables. Therefore, descriptive statistics were appropriate for the exploratory goals and structure of the dataset. However, future research might explore inferential methods using point-of-sale or consumption data to validate these perceived trends. This data could provide more accurate insights into the relationship between student preferences and food purchases, enabling nutrition professionals to fine-tune their offerings and reduce waste. It is also important to recognize that the study does not collect data on plate waste, leaving a gap in our understanding of the relationship between perceived popularity and actual consumption.

In conclusion, the findings of this study provide important insights into the food trends and preferences of students participating in the SBP based on the perceptions of school nutrition professionals. These trends align with those observed in the broader foodservice industry, underscoring the need for schools to adapt their menus to meet evolving student preferences. By incorporating popular menu items, leveraging social acceptability, and offering meals that reflect current food trends, school meal programs can potentially increase participation, reduce food waste, and better serve the needs of students. However, further research is needed to understand better the relationship between student preferences, food purchases, and food waste, as well as the impact of these trends on the overall effectiveness of the SBP.

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ABSTRACT

PURPOSE/OBJECTIVES

This study aimed to identify foods currently popular and growing in popularity in K–12 schools participating in the School Breakfast Program (SBP).

METHODS

The study utilized a national online survey conducted in April 2024 by the Institute of Child Nutrition Applied Research Division. School nutrition professionals across the U.S. were recruited via social media and direct email invitations. The survey focused on food trends and asked participants to identify popular and emerging food items in their school nutrition programs. Data analysis included descriptive statistics to assess the frequency and popularity of breakfast items by various demographics, including job title, school type, district size, and region.

RESULTS

The survey identified several key trends in school breakfast menus. The most popular menu items currently served in schools include cereal (63.7%), muffins (52.7%), and donuts (49.7%), while yogurt parfaits (40.2%) and breakfast pizza (39.4%) also ranked high. The top emerging trends in school food preferences included yogurt parfaits (30.9%) and breakfast smoothies (20.1%), indicating a shift toward trendy nutrient-dense options. Regional variations were noted, with certain foods, such as sausage biscuits, showing higher popularity in the Southeast and Southwest.

APPLICATIONS FOR CHILD NUTRITION PROFESSIONALS

The findings highlight the importance of understanding evolving student preferences in school meal programs. By aligning breakfast menus with popular and emerging food trends, school nutrition professionals can potentially increase participation in the SBP, reduce food waste, and better meet student needs. Further research is needed to collect point-of-sale data to better understand the correlation between perceived popularity and actual food purchases, which could result in improved menu offerings and minimize waste in school nutrition programs.

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Virginia School Cafeteria Manager Perceptions of Initiatives to Improve the School Nutrition Environment

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KEYWORDS: Cafeteria managers, training, local foods, student-inspired meals, scratch cooking, Transitional Nutrition Standards

INTRODUCTION:

Schools are important settings to promote healthy dietary choices for students and overall well-being (Pineda et al., 2021; Story et al., 2008; Welker et al., 2016). Initiatives like preparing foods from scratch, offering additional fruits and vegetables, and adhering to nutrition standards improve the health promotion potential of school nutrition environments and school meal quality (Gearan et al., 2019; Micha et al., 2018; Palmer et al., 2024; Pineda et al., 2021; Schober et al., 2016). Implementation of such initiatives is complex and requires buy-in and sufficient capacity from school nutrition professionals to be successful (Langner et al., 2024).

The [blinded for review] Department of Education, Office of School and Community Nutrition Programs ([blinded acronym]) received a fiscal year 2022 Team Nutrition Training Grant to support school nutrition professionals (i.e., school nutrition directors and cafeteria managers) with training to implement four primary initiatives: 1) scratch and speed-scratch cooking; 2) local food procurement and service; 3) student-inspired meals; and 4) understanding and adherence to the *Child Nutrition Programs: Transitional Standards for Milk, Whole Grains, and Sodium* ([Transitional Nutrition Standards] Child Nutrition Programs: Transitional Standards for Milk, Whole Grains, and Sodium - Final Rule, 2022). The Team Nutrition Training Grant promoted flexibility of training programs to meet state-specific needs, and thus a needs assessment among the priority audience of cafeteria managers was conducted to inform the development of a training program for [state]. Scratch cooking, local food procurement and service, student-inspired meals, and understanding of and adherence to the Transitional Nutrition Standards, were initiatives of focus to improve the school nutrition environment during the period of this needs assessment (Child Nutrition Programs: Transitional Standards for Milk, Whole Grains, and Sodium - Final Rule, 2022; Spruance & Vo, 2023; Vincent et al., 2020; Zuercher et al., 2025).

The needs assessment used established definitions for the initiatives of focus. Scratch cooking is the preparation of recipes with foods that are raw or minimally processed (Vincent et al., 2020). Speed-scratch cooking is a related technique in which ready-made products, such as dehydrated gravy, are blended with fresh ingredients to create a meal (USDA, 2022). Local food procurement lacks a standardized definition, but the



public purchase of local or regionally produced foods is a federal priority in the National Strategy for Hunger, Nutrition, and Health (The White House, 2022). Student-inspired meals are recipes that cater to the various cultural and nutritional needs of students and are perceived as a needed improvement to school meal programs by school nutrition professionals (Lamson & Miller, 2024; Langner et al., 2024). The Transitional Nutrition Standards were in effect for the 2022-2023 and 2023-2024 school years and were the precursor to the final rule, *Child Nutrition Programs: Meal Patterns Consistent with the 2020-2025 Dietary Guidelines for Americans* ([Final Rule]; Food and Nutrition Service, 2024). The Transitional Nutrition Standards and Final Rule include guidelines on milk, sodium, and whole grains, and added sugars (Final Rule only) to more closely align school meals with the *2020-2025 Dietary Guidelines for Americans* (Transitional Nutrition Standards (2022); Final Rule (2024)).

Effective implementation of nutrition programs requires preparedness and readiness by the individuals responsible for day-to-day program activities (Weiner et al., 2008); in schools, these individuals include cafeteria managers and school nutrition directors (Asada et al., 2017; Rajbhandari-Thapa et al., 2017). Participation in training programs has been shown to increase self-efficacy and confidence in implementing school nutrition environment initiatives among managers (Bean et al., 2018, 2019; Rajbhandari-Thapa et al., 2017; Stokes & Spruance, 2020). While these training opportunities often focus on knowledge and skills, (Quinn et al., 2018; Rajbhandari-Thapa et al., 2017; Stephens et al., 2016) development of leadership capacity is an equally important professional skill for cafeteria managers (Coble & Clodfelter, 2003; Sullivan et al., 2002). Cafeteria managers are important intermediaries between director level professionals, students, and cafeteria staff, and building their confidence in leadership and decision-making may be key to implementing changes in the school nutrition environment (Machado et al., 2022).

Yet, despite the consensus that training and professional development for school nutrition professionals is necessary to facilitate implementation of practices to improve nutrition environments (Langner et al., 2024; Merlo et al., 2023; Tabak & Moreland-Russell, 2015; Thomson et al., 2012), the perspectives of frontline professionals on their training needs are underrepresented in the literature (Palmer et al., 2024; Stephens & Byker Shanks, 2015). Assessing the training needs of cafeteria managers from the manager perspective supports the development of training programs to address critical barriers to change. The purpose of this needs assessment was to explore the perceptions of school cafeteria managers in [state] on their training needs to increase scratch and speed-scratch cooking, local food procurement and service, student-inspired meal service, and understanding and adherence to the Transitional Nutrition Standards. A secondary purpose was to identify manager's preferences for training format and delivery.

METHODOLOGY:

This needs assessment was deemed to be an evaluation and not human subjects research by the [blinded] Institutional Review Board in February 2023 (#22-1095).

Instrumentation

All authors collaborated to develop the focus group discussion script, with input from expert school nutrition training providers. The script included a brief introduction, ten primary questions with 2–3 probes per question, and short transition statements between topics. Table 1 contains a sample of the questions focused on the primary initiatives and perceptions of previous trainings. Each script concluded with an invitation for participants to share additional information, suggestions, or thoughts about training programs and their development. A professional translator prepared the script in Spanish.

Table 1. *Selected Focus Group Discussion Topics and Questions.*

Topic	Question	Probes
Usefulness of Previous Trainings and Preferred Changes	What has stopped you from making changes suggested in previous training?	What would have helped you make the suggested changes? What frustrates you the most about making changes that were suggested during previous trainings?
Scratch and Speed-Scratch Cooking	What barriers or challenges prevent you from preparing and serving more scratch made meals?	What resources do you need in order to prepare additional scratch made meals? What training would increase your confidence and ability in preparing scratch prepared meals?
Local Food Procurement and Service	What barriers or challenges prevent you from preparing more local foods?	What resources do you need to prepare and serve additional local foods? How could a training change your ability to prepare and serve additional local foods? What would you like a training program to include?
*Groups 4 and 5 were read a brief definition of the Transitional Nutrition Standards after asking managers to describe their current ability and comfort level in meeting the standards.		

(Table 1 continues)

Table 1 (continued). *Selected Focus Group Discussion Topics and Questions.*

Topic	Question	Probes
Student-Inspired Meals	Do you offer foods that represent most of the cultures in your school division? If so, what are some examples?	How could a training change your ability to offer foods that are relevant to the cultural needs of your students? What would you like the training program to include?
Transitional Nutrition Standards	Please describe your current ability and comfort level in meeting the Transitional Nutrition Standards.*	How would you like to improve your knowledge and ability to meet the standards? What should a training program on the Transitional Nutrition Standards incorporate?
*Groups 4 and 5 were read a brief definition of the Transitional Nutrition Standards after asking managers to describe their current ability and comfort level in meeting the standards.		

Recruitment and Data Collection

Cafeteria managers in [state] were invited to participate in the focus group discussions via an email invitation from the [blinded agency]. Managers were invited from all school divisions in [state], regardless of their division's participation in the Team Nutrition Training program, to recruit individuals from a range of urban and rural divisions. Managers registered for the focus group discussion through a Qualtrics survey.

Two hundred and two English-speaking cafeteria managers and two Spanish-speaking cafeteria managers registered to participate. Spanish was a commonly spoken language among cafeteria managers in [state] and participation in Spanish was thus offered to expand opportunity for participation by inclusivity for potential participants. Given literature that recommends five focus groups for data saturation and to identify differences among demographic groups (Guest et al., 2017; M. Hennink & Kaiser, 2022; M. M. Hennink et al., 2019; Krueger, 1994), the evaluation team recruited for five focus group discussions. Forty-eight English-speaking cafeteria managers who represented a range of characteristics of divisions (e.g., rurality, level of need) were selected to participate in four focus group discussions by [blinded agency]. The forty-eight managers were selected based on scheduling congruency and representation of a range of divisions. Both Spanish-speaking registrants were invited to form a fifth focus group.

Each focus group discussion was held via Zoom (Zoom Video Communications, San Jose, CA). Only one Spanish-speaking manager was successfully recruited, so a semi-structured interview was held with the attendee in place of a focus group discussion. A native Spanish-speaker conducted the semi-structured interview with the Spanish-speaking manager. The script for the Spanish-speaking participants included one additional question, to ask participants about the acceptability of using English printed materials during trainings facilitated in Spanish. A trained moderator, assisted by two notetakers, facilitated each English focus group discussion.

Data Analysis

Authors identified and recorded overall themes, key takeaways for each question, and illustrative quotations during a debriefing session following each focus group discussion. The notetaker for the semi-structured interview (author X), who is a proficient Spanish speaker, prepared a summary and identified key takeaways from the interview data. Following guidance from McNall & Foster-Fishman, (2007), focus group and interview data were not transcribed; rather, the detailed debriefing reports and audio files were used for data analysis. Two authors (X and Y) independently completed content coding of the focus group and semi-structured interview data in Microsoft Word for interest among managers, barriers, and training considerations for each *a priori* topic of 1) scratch and speed-scratch cooking, 2) local food procurement and service, 3) student-inspired meal and 4) the Transitional Nutrition Standards. The authors met in person to review the alignment between coding and resolved discrepancies through discussion until consensus was reached. Author X and author Y also collaborated to determine key takeaways for usefulness of previous trainings and drafted an initial report of these findings to share with authors from the (blinded agency). These key takeaways are presented in the results section because of their utility for the school nutrition professional community.

RESULTS AND DISCUSSION:

Participants' experience in their current positions as school cafeteria managers ranged from less than one year to several decades. Some managers worked together in a division or otherwise knew each other, and managers from elementary, middle, and high schools across [blinded state] participated, representing divisions of different sizes and rurality. Table 2 contains summarized results for interest among managers, barriers, and topic-specific training considerations for the four primary initiatives. The subsection 'usefulness of previous trainings and preferred changes' includes considerations for training design that were highlighted by cafeteria managers. Overall, the results provide considerations for cafeteria manager training design and content, with specific considerations for scratch cooking, local food procurement, student-inspired meals, and adherence to the Transitional Nutrition Standards.

Table 2. *Consistent Interest, Barriers, and Training Considerations with Illustrative Quotations by Primary Initiative*

Topic	Interest	Barriers	Training Considerations and Suggestions	Illustrative Quotation
Scratch and Speed-Scratch Cooking	<ul style="list-style-type: none"> • Opportunity to introduce students to healthy, wholesome food • Recognition that students like the scratch foods • High interest for more scratch meals 	<ul style="list-style-type: none"> • Staff time, skills, burnout • Measurement conversion • Recipes incomplete or written with inaccessible terms (e.g. 0.06 cups) • Equipment needs, including an inability to tailor recipes to individual kitchens • Limited ordering options 	<ul style="list-style-type: none"> • Request that trainers understand and are familiar with what it is like to work in a kitchen • Preference for hands-on training • Include cafeteria staff • Portion size conversions • Equipment substitutions • Reading and understanding recipes • Tips for batch cooking, such as maintaining freshness 	<p><i>"We are always working short here...we don't have enough staff"</i></p> <p><i>"I have kids who don't eat pasta at home, but eat pasta here because they love our marinara"</i></p> <p><i>"I don't know how I could scratch cook with my equipment: two burner stove, two steamers, two ovens...maybe because I've never done it before...maybe it's something I need to learn."</i></p>

(Table 2 continues)

Table 2 (continued). *Consistent Interest, Barriers, and Training Considerations with Illustrative Quotations by Primary Initiative*

Topic	Interest	Barriers	Training Considerations and Suggestions	Illustrative Quotation
Local Food Procurement and Service	<ul style="list-style-type: none"> General interest, especially in the potential to support local farmers and small businesses Those already using local foods valued it 	<ul style="list-style-type: none"> Director support Supply chain issues, including limited options from distributors Staff time (based on perception that local foods are whole, raw fruits and vegetables) Perception that local foods are more expensive 	<ul style="list-style-type: none"> Recipes to use local foods Receiving, storing and cleaning local foods Cooking skills (based on perception that local foods are whole, raw fruits and vegetables) Definitions of local foods Procurement strategies 	<p><i>"When you are dealing with local, the storage, the cleaning, everything is a little different than when you are getting canned foods."</i></p> <p><i>"It's nice to support local rather than some place we don't know"</i></p>

(Table 2 continues)

Table 2 (continued). *Consistent Interest, Barriers, and Training Considerations with Illustrative Quotations by Primary Initiative*

Topic	Interest	Barriers	Training Considerations and Suggestions	Illustrative Quotation
Student-Inspired Foods	<ul style="list-style-type: none"> General interest but lack of clarity on how to advance initiative 	<ul style="list-style-type: none"> Uncertainty about how to gather information on student-inspired recipes Confusion about what constitutes a student-inspired food (e.g. walking tacos or teriyaki chicken were given as examples) Lack of perceived diversity within school divisions by some participants 	<ul style="list-style-type: none"> Food and recipe examples Highlight comfort, kid friendly, or holiday celebration foods from different cultures Strategies for learning about a range of recipes Include nutrition information for new foods and recipes 	<p><i>"I would like to know what their culture eats, what is their cheeseburger or pizza?...What is their item they have to have where they are?"</i></p> <p><i>"We have a pre-made menu. It is a 4 week cycle, I don't feel we offer a lot of different choices"</i></p> <p><i>"Maybe it's time to step outside of the box and try that...food from Hungary or Mexico, and maybe they [the children] will really like it"</i></p> <p><i>"[County] has a lot of Hispanic children, we do not offer anything special for them"</i></p>
Transitional Nutrition Standards	<ul style="list-style-type: none"> High interest and recognition that understanding would improve capacity to perform well in the role of cafeteria manager 	<ul style="list-style-type: none"> The terminology of "Transitional Nutrition Standards" was unfamiliar Concern that changes would be unpalatable to students 	<ul style="list-style-type: none"> Few details discussed, however, training programs that assess terminology used by intended audience may increase understanding of topic 	<p><i>"Maybe we are just calling it something different and that's why I am confused."</i></p> <p><i>"There needs to be a class. I am completely baffled that I don't know this."</i></p>

Content-Specific Considerations for Scratch Cooking, Local Foods, Student-Inspired Meals, and the Transitional Nutrition Standards

Many of the considerations for local foods and scratch cooking were similar, with managers focused on the perception that local foods would be received in raw, whole form. Successful school foodservice training allows for modifications within varying physical infrastructures (Stephens & Byker Shanks, 2015). Kitchen infrastructure was stated as a barrier to scratch cooking and local foodservice, aligning with previous findings that infrastructure is often a primary concern among school nutrition professionals tasked with scratch cooking or increasing meal participation (Zuercher et al., 2022, 2025). Managers suggested that training programs be flexible and include suggestions for how to modify recipes and cooking techniques to various equipment setups, reflecting previous findings on training preferences (Stephens & Byker Shanks, 2015). School nutrition professionals have previously reported that they use workarounds to adhere to new policies (Poole et al., 2024) and developing training that recognizes varying infrastructure could improve buy-in towards initiatives. Investments in infrastructure or practice modifications within current kitchen equipment may provide structural support to advance scratch cooking and local foodservice, thus creating a more health promoting school food environment (Schober et al., 2016; Zuercher et al., 2025).

Managers were interested in increasing scratch cooking, stating that the students enjoyed scratch-prepared meals: *"...the students love it. They ask for it."* Stated barriers included staff time and infrastructure, the same common limitations identified in other public-school systems (Vincent et al., 2020; Zuercher et al., 2025). Procurement of ingredients for scratch-prepared meals must align with the kitchen capacities (Ahmed et al., 2022), and a mutual understanding of these needs could be generated through co-attended training for directors and managers. Procurement of school food is often more complicated for scratch ingredients (Stanley et al., 2012), and managers expressed a desire to understand these complications. While cafeteria manager training cannot address all of the organizational and systemic changes required to transition to scratch cooking, it could incorporate some practices to advance the capabilities of facilities, human resources, and marketing (B. Collins, 2012; Schober et al., 2016). Some managers were aware of the many social and cultural characteristics of students within their divisions but were unsure of specific foods or recipes that celebrated and reflected a range of student demographics. Participants stated their desire to learn about student-inspired foods to better serve their students. Other managers focused on the availability of personalized food options, such as a sandwich bar, but did not understand student-inspired meals or discuss the range of social and cultural characteristics of the students in their divisions. One participant recognized the potential of serving student-inspired foods and integrating the food into other school lessons like history and language. Cultural inclusion in school nutrition has been identified as a key component for effective nutrition education to promote healthy dietary choices among students (Greaves-Peters & Koch, 2024), and understanding stakeholder perspectives on best practices is an important research direction.

Few details were discussed on the Transitional Nutrition Standards. Managers were interested in learning more about the standards and requested training to understand the background and implications of the policy. The desire to learn more about the Transitional Nutrition Standards was consistent across all focus groups and the semi-structured interview. There was some concern that sodium standards would decrease the palatability of

the foods offered, and affect the students' perception of the quality of school meals: *"If you take any more out, what is going to be left for them to taste? That is going to be less kids wanting to eat."* During previous updates to the school nutrition standards, successful strategies to improve adherence have included implementation support like training, equipment purchases, and director involvement (Asada et al., 2017; Poole et al., 2024). Results of this needs assessment align with known strategies to improve implementation of school nutrition standards. An additional consideration for training programs is to tailor materials with terminology familiar to school nutrition professionals. Participating managers may have been knowledgeable about the Transitional Nutrition Standards, but were using different terminology: *"What are the standards? I know we are restricted in sodium and sugar."* Groups 1 and 2 discussed sodium restrictions: *"I know they are cutting the salt."* In focus groups 4 and 5, moderators referred to the Transitional Nutrition Standards as the current USDA school meal regulations and provided a brief definition. Following this prompting, managers discussed how changes to flavored milk and sodium requirements would be received by students. While groups 4 and 5 discussed flavored milk requirements that were not mentioned in groups 1 and 2, there were no major differences in the depth of information provided by managers across groups that were provided a definition of the Transitional Nutrition Standards and groups that were not provided a definition. Cultural tailoring of training materials, including terminology, may increase the sense of empowerment and ownership by school cafeteria staff (Hildebrand et al., 2018; Stephens & Byker Shanks, 2015).

Usefulness of Previous Trainings and Preferred Changes

Cafeteria managers discussed in general terms their perceptions of previous training programs and preferred changes to training structures. Two themes were identified within this category: 1) setting and modality and 2) co-learning and inclusive decision-making.

Setting and Modality

In-person training was desired to facilitate group and peer learning, a finding reported in other school cafeteria training assessments (Flure et al., 2020; Stephens & Byker Shanks, 2015). Managers referenced their positive attitudes about the school nutrition professional community and shared that they use social networks and Facebook to learn from other schools. Managers indicated they called each other with questions or for support, especially during the on-boarding process. Several mentioned they did not have adequate support as they were learning the position, and those that did have support found it in more senior colleagues, with one participant stating: *"Everything I learned, I learned from [senior manager]."* Professional networks have been reported as essential support systems for school nutrition directors (Cornish et al., 2015), and the results of the present evaluation suggest a similar importance for cafeteria managers.

In-person training might also be important given the digital literacy of the participating managers. Some managers were unable to fully participate in the focus group discussions and were limited to providing input via the chat function or via a shared Zoom link with another manager. One participant stated that: *"I'm surprised that I was even able to join the meeting, I'm not computer savvy, most of the time when I do trainings, I'm at work and my boss helps me."* If online trainings are necessitated due to logistics, a written instruction

sheet or common troubleshooting tips could be provided prior to the online meeting so that training participants can practice connecting to the online platform (Archibald et al., 2019).

Managers were committed to student well-being but referenced the personal difficulties of their positions: *"This is a hard job, physically, mentally, this is a hard job. There is a lot of stress."* To reduce burnout among school nutrition professionals, it was suggested to combine training topics when possible and include ideas for how managers can support their staff so they can attract and retain people. One participant highlighted this idea, saying: *"We can read everything in the world on food and meal preparation, but what about our staff and their well-being? There's no training on that. They are burned out."* Inadequate staffing and high turnover have been documented as barriers to increasing scratch cooking, local food procurement, and other initiatives meant to improve the school nutrition environment (Asada et al., 2020; Zuercher et al., 2022). Staff burnout as described by the cafeteria managers may contribute to high turnover, therefore, an increased focus on staff well-being may improve staff retention and influence successful implementation of school nutrition environment initiatives.

Co-Learning and Inclusive Decision-Making

Cafeteria staff have reported elsewhere that support for nutrition programs is needed from school nutrition leadership to promote program success and student well-being (Slawson et al., 2013). Managers were interested in increasing the primary initiatives but felt excluded from or unable to make decisions to advance these goals. The managers' perceptions of exclusion are reflected in reports that frontline staff are often not included in policy development and implementation discussions, despite interest in such initiatives as Farm to School (Nothum et al., 2019). Specifically, managers stated they were constrained by purchasing systems and menus planned by their supervisors: *"I don't have an option, I just follow the menu."* Menus and recipes were often stated as inadequately designed for the realities of specific kitchens, with one manager sharing: *"Sometimes [the recipes] say 0.06 cups, like what is that?"*

Managers asked for directors to understand the day-to-day life in the kitchen and to be able to work with directors to develop tailored solutions. One participant stated that *"We are the only ones that understand the difficulties of our jobs,"* a sentiment that was acknowledged with strong agreement from other managers. Managers wanted to have a greater understanding of decision-making within their school nutrition program, especially in the design of menus. There was a perception that managers' expertise was not considered in decision-making: *"If you say something, the powers that be may not listen or hear what you are saying."* One frequently suggested strategy to improve communication and collaboration between managers and directors was to conduct co-learning training programs. Co-learning programs that include managers and school nutrition directors may facilitate greater respect and understanding of daily challenges within the respective roles (Cromwell & Kolb, 2004; Martin, 2010). Co-learning can also support informal train-the-trainer programs (Schober et al., 2016), which may be effective given the importance of social networks among cafeteria managers.

CONCLUSIONS AND APPLICATION:

This needs assessment provides insight into the perspectives of cafeteria managers about training support they need to increase scratch and speed-scratch cooking, local food procurement and service, student-inspired meals, and adherence to the Transitional Nutrition Standards. Training solutions to address the barriers identified for the priority initiatives, and broader barriers to improvements to the school nutrition environment, are offered below. Individual-level solutions may mitigate some of the barriers identified by cafeteria managers in this needs assessment, however, we also recommend exploration of organizational and systems level interventions to address barriers to school nutrition environment improvements, consistent with recommendations presented elsewhere (Chung et al., 2023; Keleher et al., 2024; Zuercher et al., 2025).

Practice Applications

School divisions can explore actions to create a more collaborative relationship between cafeteria managers and school nutrition directors. Manager-suggested actions included shared training for managers and directors, or director attendance at manager training. Less formal interactions, such as directors working alongside kitchen staff for a service period, may also facilitate co-learning and increased understanding of decision-making processes (Myers, 2015). The [BLINDED AGENCY] offered two in-person culinary skills and commercial kitchen equipment training for school nutrition directors, one in October 2023 and one in April/May 2024. Given that in-person training is generally preferred by school nutrition professionals (Flure et al., 2020; Stephens & Byker Shanks, 2015) and corroborated by our findings, divisions could explore strategies for collaborative and in-person learning activities.

Workplace burnout and staff turnover were key barriers to priority initiatives. While best practices for workplaces to promote mental health include interventions at the organizational and societal level, (Goetzel et al., 2018; Wu et al., 2021) and were outside the scope of this evaluation, the results presented here are a call for school nutrition support programs to include mental health promotion strategies. Individual interventions delivered through training programs are an important first step to create a supportive environment; however, organizational strategies must be delivered in conjunction with training to prevent burnout among school nutrition professionals. Potential organizational strategies to support workforce well-being for implementation of scratch cooking and local foods are to purchase time-saving equipment, like produce sectionizers (Poole et al., 2024), or to develop menus with flexibility to accommodate seasonal local food purchases.

Policy Applications

Increased public procurement of local foods is an important strategy to strengthen local food systems and is positively perceived among school nutrition professionals (Thomson et al., 2024). Managers were overall interested in increasing local foods but stated limited self-efficacy as a barrier to implementation. Previous research has reported that frontline cafeteria staff are often excluded from local food procurement policy development and implementation (Nothum et al., 2019), but that when staff are included in these discussions, the initiatives are more likely to be successful in meeting implementation goals (Bagdonis et al., 2009). Training for frontline staff on local food use skills, such as receiving and processing, is necessary to support local food



procurement policies (Nothum et al., 2019). Flexibility within standardized recipes to substitute seasonal, local foods addresses manager needs to adjust for varying equipment and skill levels and local food distribution schedules.

Research Implications

Managers had a desire to be successful in their jobs because they viewed their positions as caretakers of student well-being. It has been reported elsewhere that foodservice professionals' attitudes have the potential to influence actions towards implementation of new initiatives (Choi & Rajagopal, 2013; J. Collins et al., 2017). Future research could explore how managers' care towards students could influence their practices, and whether framing trainings to enhance the well-being of students increases manager buy-in on school nutrition environment changes.

Some individual managers did report that they serve a portion of their meals from scratch, and future research could determine the demographics, human resources, and infrastructure present in the divisions that are serving scratch meals. A statewide survey in California reported that rural schools and schools with a higher income and percentage of white students were more likely to prepare scratch meals (Vincent et al., 2020), and [blinded state] and other states could investigate their own demographic trends. Similarly, infrastructure is a key factor in the implementation of scratch cooking (Trent et al., 2019; Vincent et al., 2020; Zuercher et al., 2025), and understanding how infrastructure varies across a range of demographically different school divisions can guide policy and practice action, such as identifying local funding opportunities for equipment purchases.

There was an overall lack of understanding of student-inspired meals. While managers expressed a desire to serve meals that the students would enjoy, many were unable to provide examples of meals that meet the social and cultural needs of their students. Researchers could explore effective strategies for identifying foods and recipes popular among a range of cultures.

Our purpose was to evaluate the needs of cafeteria managers in [blinded state]. Given that school nutrition policies, resources, and practice vary by state and division, other states need context-specific data to inform their training programs. This evaluation may serve as a guide for other needs assessments and formative evaluations.

Limitations

Due to technological barriers, not all focus group participants had equal opportunity to share during the focus group discussions. Therefore, the results may be skewed towards those manager perceptions who were able to successfully navigate the Zoom platform. Only one Spanish-speaking participant attended the focus group discussion and thus the data from the Spanish-speaking participant is limited to their perceptions, as the participant was not exposed to new ideas or changes within a focus group conversation (Krueger, 1994). Although invited managers were selected to represent divisions with a range of demographic characteristics, we did not fully explore how manager perceptions may vary by division demographics like rurality, school meal participation, or size. Self-selection bias may be present among the participant sample, given that managers



opted-in to focus group recruitment. While some bias was introduced during data collection by providing a brief definition of the Transitional Nutrition Standards to only some focus groups, there was overall little information shared by managers on this topic.

Conclusions

[Blinded State] cafeteria managers expressed interest in increasing scratch and speed-scratch cooking, local foods, and student-inspired meals. While managers lacked understanding of the Transitional Nutrition Standards, they wanted to learn more to be in compliance. Common barriers to advancing the priority initiatives included staff time and equipment limitations. Strategies to increase buy-in from managers may include greater inclusion in decision-making processes and co-learning opportunities with school nutrition directors. Managers were generally interested in the priority initiatives, but their perceived exclusion from decision-making was a barrier to change. Framing priority initiatives as a part of student support may increase buy-in, as managers shared a high level of care for the well-being of students. Training programs that address individual skills, such as modifying recipes to work with existing kitchen infrastructure, can mitigate some of the barriers to implementation of the priority initiatives. Additional interventions at the organization and systems level are likely needed to eliminate barriers to scratch cooking, local food procurement, student-inspired meals, and adherence to the Transitional Nutrition Standards. Understanding the needs of managers to implement school nutrition environment initiatives can inform training programs tailored to address priority barriers so that the school nutrition environment can be improved to promote student health and well-being.

DECLARATIONS

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ABSTRACT

PURPOSE/OBJECTIVES

School cafeteria managers are key agents of change for improving the school nutrition environment. Understanding managers' training needs and their perceived barriers are essential for successful implementation of initiatives. The purpose of this needs assessment was to explore the perceptions of [state] school cafeteria managers regarding training needs for four initiatives: scratch cooking, local food procurement and service, student-inspired meals, and adherence to the *Child Nutrition Programs: Transitional Standards for Milk, Whole Grains, and Sodium* [Transitional Nutrition Standards].

METHODS

Participants were [state] English- or Spanish-speaking school cafeteria managers. Twenty-one managers participated in four focus groups and one interview via Zoom in March 2023. Content analysis was used to determine interest, barriers, and training considerations for each initiative.

RESULTS

Managers stated that recipes for scratch cooking and local foods should be flexible to equipment and supply chain differences. While there was general interest in student-inspired foods, managers were unsure of what constitutes these foods or how to identify student inspired recipes. Few details were discussed on the Transitional Nutrition Standards and managers wanted more information to support successful adherence. Managers felt that exclusion from decision-making and staffing constraints were common barriers to implementing training suggestions. The preferred training modality was in-person and concurrent with directors.

APPLICATIONS TO CHILD NUTRITION PROFESSIONALS

Agencies may consider training programs that are in-person and include school nutrition directors to facilitate team decision-making. Training to increase managers' self-efficacy with time-saving equipment or adjusting recipes may address barriers to scratch cooking and local foodservice. Definitions and examples of student-inspired meals could be provided in training. Communicating details of the Transitional Nutrition Standards may improve manager confidence with adherence.

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Meat/Meat Alternates in Middle School Menus: A Comparison

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KEYWORDS: School lunch menus, beef, poultry, meat/meat alternate, National School Lunch Program, meal pattern, protein products

INTRODUCTION:

National School Lunch Program

The Richard B. Russell National School Lunch Act of 1946 established the National School Lunch Program (NSLP) which is a federally assisted meal program for children in public and nonprofit private schools and residential childcare institutions.¹ It is administered by the U.S. Department of Agriculture Food and Nutrition Services (FNS) which sets NSLP nutrition standards and establishes patterns for meals served to children. In 2010 the Healthy Hunger-Free Kids Act (HHFKA) introduced changes in a NSLP reimbursable meals with a goal to reduce health risks during childhood by providing meals that reflected the 2010 Dietary Guidelines for Americans.²

In 2012, school meals standards that emphasize nutrient dense meals high in recommended nutrients and moderate in calories were finalized.³ These standards increased availability of fruits, vegetables, and whole grains, while providing choices in meat alternates such as mature beans, dry peas, tofu and soy yogurt. This signaled healthy changes in school meals, especially in the main dish.^{4,5} In a 2020 study that quantified the dietary quality of hypothetical school meals consistent with HHFKA Initiatives, Patel et al. (2020) replaced processed and red meats with plant-based proteins and lean animal products.⁶ This strategy improved diet quality by lowering saturated and total fat content. How prevalent, then, are meat alternate main dishes on school menus today and how does this compare to meals served prior to HHFKA? A comparison of current day lunch menus to archived lunch tray photos offers an opportunity to answer these questions.

School Nutrition Programs are required to serve meals that contain Meat/Meat Alternate (M/MA) in amounts consistent with meal pattern requirements and that are part of a main dish.⁷ According to the National School Lunch Program (NSLP) meat dishes are 100% animal-based such as beef, poultry and fish. Cheese and yogurt are dairy foods that serve as meat alternates as do whole eggs. Meat alternates that are plant-based contain no animal meat. Examples include soy yogurt, dry beans and peas, tofu, tempeh, peanut butter and other nut or seed butters, and nuts and seeds.

The purpose of this review was to document the appearance of meat alternates in Texas middle school meals today and compare results to appearance on lunch photos recorded prior to HHFKA. Limiting document analysis of online menus to the same state where lunches were previously photographed recognized the role



that consistency in food preferences plays in making food choices and that those choices often are reflected school lunch menus.

METHODS:

The University Internal Review Board reviewed the study protocol and determined that it was exempt from further review in accordance with 45 CFR 46.101 (b). To gain insight into main dish changes since implementation of HHFKA, current menus from Texas middle schools were reviewed and the main dishes evaluated for meat alternates. Results were compared a similar analysis of main dishes appearing on lunch trays photographed in two Texas middle school cafeterias in spring 2011.^{8,9} The intent was to document the appearance of meat alternates on recent school lunch menus and compare results to those observed prior to HHFKA and answer the question: Do beef and poultry still dominate or are plant-based alternatives appearing?

RESULTS AND DISCUSSION:

Online menus from 24 different school districts from five Texas Department of Agriculture Regions (TDAR) were selected for review.¹⁰ This included five schools in Region 1 (West Texas), five in Region 2 (North Texas), four in Region 3 (Gulf Coast), five in Region 4 (South Central) and five in Region 5 (Valley). Low and high enrollments figures were as follows: Region 1, 98, 507 students, Region 2, 770, 1068, Region 3, 111, 826, Region 4, 161, 1432, and Region 5, 230, 1114. Two schools served the same menus for grades K–12, three for grades 6–12, 13 for grades 6–8, 1 for grades 5–8, four for grades 7–8, and 1 for grades 9–12. Six schools were operated by a Food Service Management Company (FSMC). A website evaluation of lunchtime menus took place during the week of October 21–25, 2024. All menus were from schools that participated in the National School Lunch Program (NSLP).

Online Menu Analysis

A total of 120 middle school menus were accessed resulting in 244 main dishes observed. Several districts in the South Central and Valley Regions had a four-day school week and did not serve lunch on Fridays. School menus sometimes included more than one main dish. To avoid double counting the study focused on main dishes across the week rather than the number of times each appeared on a specific menu. An example is two main dishes with poultry, such as chicken sandwich and chicken nuggets, appearing on the same menu. This was recorded as a single poultry instance.

Beef and poultry appeared most days, indicating that these meats continued to be widely offered. Typical main dishes were cheeseburger, meat chalupas, chicken sandwich, chick wings, fajita tacos, steak fingers, and beef nachos. Chicken items were common, appearing at least three times during a five-day school week and in some instances every day. Beef appeared almost daily, underscoring its continued popularity. In terms of other meats, fish dishes were primarily observed in the North Texas Region.

Non-meat main dishes typically appear only one or two days per week with cheese pizza, being the most featured alternative. Dishes featuring plant-based alternatives, such as bean patty burger and bean/cheese burritos, were more prevalent in schools from the West Texas, North Texas and the Valley Regions. Menus in the North Texas Region included more non-meat dishes than those in the other four regions. In all six regions,



non-meat options such as cheese, eggs, and bean-based main dishes were less frequently observed than beef and chicken dishes.

Archived Lunch Tray Images

Descriptive statistics were used to analyze 1,282 paired images of archived lunch trays to capture the meat/meat alternate in main dishes. All contained either beef, chicken or dairy with cheese pizza, chili cheese nachos, hamburger/cheeseburger and chicken nuggets appearing the most often. Beef dishes included hamburger/cheeseburger, bean and beef burrito, BBQ rib sandwich, and steak fingers. Poultry dishes included chicken nuggets, chicken sandwich, turkey chili and cheese nachos, chicken salad, and chicken fajita. No plant-based main dishes were observed that were not in combination with beef, poultry, or dairy. One main dish, beef and beans burrito, combined both meat and plant-based alternate. Pizza appeared on 33.4% of trays, turkey chili & cheese nachos on 16.8%, chicken nuggets on 14.0%, and hamburger/cheeseburger on 10.1%. The image analysis of archived lunch trays photographed in 2011 underlined past dominance of meat in main dishes, particularly beef and poultry, and the absence of plant-based options. An evaluation of 2024 menus revealed a continued reliance on beef and with cheese pizza and bean dishes serving as the leading non-meat alternatives.

Table 1. Archived Images: Main Dish by Meat Source, Appearance, and None Left (All Consumed) After Meal.

Main Dish (Entrée)	Meat Source	Number of Trays	None Left
Pizza (dairy, beef, pork)	Mixed	428	305
Chili & cheese nachos	Poultry	216	162
Chicken nuggets	Poultry	180	170
Hamburger/cheeseburger	Beef	129	116
Steak fingers	Beef	71	61
BBQ rib sandwich	Beef	55	41
Beef and beans burrito	Beef	54	49
Chicken crispito	Poultry	45	37
Chicken in sauce	Poultry	33	23
Chicken sandwich	Poultry	32	22
Chicken fajita	Poultry	24	8
Chicken salad	Poultry	15	8

Table 2. Meat Alternate (M/MA) by Appearance* and Percent of Online Menus.

M/MA	Beef	Poultry	Other Meat	Cheese	Bean
Appearance	77	81	34	39	13
Percent (%)	31.6	33.2	13.9	16.0	5.3

*The number of days that at least one main dish containing an M/MA was on a menu

APPLICATIONS TO CHILD NUTRITION PROFESSIONALS:

Conclusions

Moderate or significant challenges in the procurement of popular entrees such as pizza, burritos, chicken, and burgers were reported by the majority (74.2%) of responses to the 2024 *School Nutrition Trends Report*.¹¹ This presents an opportunity to explore new options that incorporate plant-based main dishes. In a 2019 study of plant-based entrées, Flores et. al found that elementary school students responded positively to new dishes that incorporated tofu, lentils and chickpeas.¹²

The School Food Authority Survey III cited continued high food costs as a supply chain challenge and an increase in scratch cooking and local food purchasing as a response.¹³ Expanding main dishes to include plant-based choices has the potential to benefit both the school lunch program and its students through lowering operating costs as it meets nutrition standards.

Limitations

The generalizability of results from a review of online middle school menus is limited to districts with similar characteristics, student demographics, and meal production resources. Conclusions drawn from this analysis of lunch tray images captured during a 2011 field study are limited by the uniqueness of the site where the photographs were taken.

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ABSTRACT

OBJECTIVE

The objective of this study was to report the frequency with which Meat and Meat Alternate (M/MA) protein sources appeared on archived school lunch tray images and to compare results to current trends in middle school lunch menus. The amount of beef, poultry, other meat, and non-meat components remaining on lunch trays images post-consumption was estimated to rank order main dishes based on appearance and potential for food waste. The range of M/MA alternate choices on present day school lunch menus was tabulated to gain insight into protein source trends for comparison.

METHODS

Digitally archived middle school lunch tray images were systematically reviewed to document appearance of beef, poultry, other meat, and non-meat components with implications for planning healthy meals and moderating food waste in cafeterias. These images were the result of a 2011 field study conducted in two middle school cafeterias in Texas. Images were paired pre- and post-consumption to allow for estimation of the serving portion remaining at the end of a meal period. More recently, document analysis of online middle school menus in five Texas regions was conducted to observe trends in protein sources and compare results to main dishes photographed prior to implementation of the Healthy Hunger-Free Kids Act of 2010. In a foodservice setting the resources invested in producing M/MA choices are optimized when foods are consumed, and waste is minimized.

RESULTS

Review of archived middle school lunch trays revealed a historic dominance of beef and chicken in main dishes and the absence of alternate protein products. A website evaluation of current day menus underlined a continued reliance on beef and poultry with the emergence of alternative protein sources such cheese and beans which are dairy and plant-based respectively.

CONCLUSIONS AND IMPLICATIONS

The predominate of beef and poultry as the M/MA in middle school lunch main dishes continues with the appearance of dairy (cheese) and beans as alternate protein sources in current day menus.

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Enhancing Food Safety in Family Child Care: Evaluation of a National Toolkit Initiative

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KEYWORDS: Institute of Child Nutrition (ICN); Child Care; Food safety, Kits, Thermometers; Feeding Infants Safely; Insulated tote; Survey; Best practices.

IDENTIFICATION OF THE PROBLEM/CHALLENGE:

Family child care is one of the critical pillars of early childhood education in the United States (US). It is a form of care for small groups of children in a private home, house, or apartment. Parents working nontraditional hours in low-paying jobs usually use this form of child care as it is flexible and affordable (ChildCare, n.d; Congress, 2010; Roberts et al., 2014)Center for American Progress, 2025; First Five Years Fund, 2023). According to the National Association of Family Child Care, 40% of 11 million young children with working mothers spend more time in family child care than other child care facilities (Bromer et al.; National Association for Family Child Care, n.d).

If appropriately educated, family child care providers can positively influence children's food habits by adopting and modeling healthy practices. This is important, as children tend to adopt these habits early in life (Patrick & Nicklas, 2005). Child care providers should take extra care when purchasing, preparing, and serving food to children. In a child care facility, this is particularly important as there is a risk of quick transmission of diseases among multiple children (Centers for Disease Control and Prevention, 2023, 2027; United States Department of Agriculture, 2024c). Teaching food safety practices, such as proper handwashing and excluding sick persons from child care, can help reduce the occurrence of foodborne illness outbreaks (Centers for Disease Control and Prevention, 2024; United States Department of Agriculture, 2024c)

Research from the Center of Excellence for Food Safety Research in Child Nutrition Programs reported concerns for family child care providers' general food safety knowledge (Paez & Alcorn, 2019). While there are various food safety guidelines and resources available for general use, specialized toolkits targeting family child care settings remain limited. Some existing resources, such as the USDA's Food Safety for Child Care and Fight BAC! campaigns, focus on food safety in larger child care centers or schools but may not fully address the unique needs of smaller, home-based child care providers. The *Family Child Care Food Safety Kit* aims to fill this gap by providing tailored tools and guidance specifically designed for family child care environments. The Family Child Care Food Safety Kit was developed by the Institute of Child Nutrition (ICN) which is a federally funded national center dedicated to child nutrition that provides training and education resources, including



food safety, for CACFP audiences. The kit was developed to meet the needs voiced by the CACFP audience who reviewed the ICN's nontraditional Summer Meals Food Safety Kit in 2016. This audience was CACFP State agency employees attending the 2016 USDA/ICN State Agency meeting. Therefore, the objectives of this study were to examine the perceived usefulness and acceptance of the Family Child Care Food Safety Kit developed by the ICN.

ACTIONS TAKEN:

The Items Included in the Final Family Child Care Food Safety Kit

Supplementary figure 1 shows the items included in the final ICN kit. The following is a detailed list of the kit items.

- Appliance thermometers (2)
- Cooking temperatures magnet
- *Feeding Infants Safely in Family Child Care* (informational booklet)
- Food thermometer
- Instruction sheet (not shown in Figure1)
- Insulated tote
- *Keeping Food Safe in Family Child Care* (food safety best practices guide with CACFP recipes)
- Laminated *How to Properly Wash Your Hands* poster
- Pen

The Timeline of the Kit Development

The development of the Family Child Care Food Safety Kit followed a three-phase approach from 2017 to 2019. At the 2016 USDA State Agency Meeting, the ICN presented a prototype of the nontraditional Summer Meals Food Safety Kit, which was met with positive feedback from State agencies. For the 1st prototype survey, we asked "Do you have any other comments/questions/suggestions related to this kit?", 11 out of 36 responses (30.56%) requested kits for CACFP audiences.

To identify the most appropriate items for inclusion, the ICN collected feedback using surveys with end users. Feedback from Phase 1 was collected from 14 family child care providers, and this information helped shape the design of the prototype for Phase 2. In Phase 2, further feedback was collected from 75 participants at the National Child Nutrition Conference (United States Department of Agriculture, 2026). This feedback was used to develop the physical prototype, which included adjustments to the kit's contents and usability based on participant suggestions. For Phase 3, the prototype was distributed to family child care providers, and feedback from 16 respondents was gathered regarding the kit's usefulness, the relevance of the food safety topics, and the practicality of the cookbook recipes. This information was used to finalize the kit's contents, with the inclusion of essential tools like thermometers and food safety guides.

While there were no specific incident reports of foodborne illness that directly triggered the development of this kit, the investment was driven by the recognition of the general risks of foodborne illness in child care

environments (Centers for Disease Control and Prevention, 2025), where young children are particularly vulnerable (Scallan et al., 2011). Supplementary table 1 shows the different surveys and response rates for each phase.

The 2022 Family Child Care Food Safety Kit Feedback Survey

The Family Child Care Food Safety Kit was provided at no cost to recipients, funded by the U.S. Department of Agriculture (USDA) through an agreement with the ICN. The funding aimed to support the enhancement of food safety practices among family child care providers participating in the Child and Adult Care Food Program (CACFP). In 2021 and early 2022, the ICN sent out 17,341 Family Child Care Food Safety Kit to all 7 USDA Food and Nutrition Service regions (Mountain Plains, Midwest, Northeast, Mid-Atlantic, Southeast, Southwest, and Western Regions) across 53 states and territories in the U.S. (United States Department of Agriculture, 2024b). Prior to the distribution of the Family Child Care Food Safety Kit, communication was conducted via email. These emails informed family child care providers about the availability of the kit and provided instructions on how to order it. Additionally, the kit itself included detailed instructions on how to use the provided items to improve food safety practices.

To evaluate the effectiveness of the kit, the ICN developed a digital feedback survey using Qualtrics, a method commonly used for program evaluation (Nulty, 2008). The feedback survey included three sections: demographic data, kit-specific questions, and future resource and training development for family child care providers. The survey was reviewed and approved by three specialists in education and training from ICN. Their expertise includes curriculum development, instructional design, and professional training. The Specialists that reviewed the survey did have previous experience in survey design. Although the specific survey was not piloted, it was adapted from the Summer Meals Food Safety Kit surveys that had already been used three times. Minor adjustments were made based on their suggestions, including adding an "other" option to some of the questions.

The inclusion criteria for this study required participants to be family child care providers who had ordered the Family Child Care Food Safety Kit. However, we received responses from other stakeholders, including sponsoring organizations and state agencies, who also ordered the kit (22.4% of the sample). Sponsors are organizations or agencies responsible for coordinating the distribution of materials and resources, such as the Family Child Care Food Safety Kit, to family child care providers. These stakeholders play a critical role in the distribution and oversight of the kit's use. Their feedback provides valuable insights into the kit's broader acceptance and utility.

On June 17, 2022, the survey was sent to a convenience sample of 1,995 contacts who had ordered one or more kit, as these individuals were identified as the most relevant audience for providing feedback. Reminders to complete the survey were sent on July 19 and August 16, and the survey closed on September 1, 2022. The survey consisted of 19 questions (see Supplementary Material). Only the analyses of questions 1-7 are included in this paper, while the remaining questions will be analyzed and discussed in future publications.

For the demographic data, respondents' state of residence, job title, staff count, and number of children in the respondent's care were collected. For the kit-specific questions, the ICN asked respondents to choose one of five descriptors to reflect what they thought about the usefulness of each kit item. Each option was assigned a Likert scale point value, and then the average of each response was determined (Not at all Useful = 1, Slightly Useful = 2, Moderately Useful = 3, Very Useful = 4, Extremely Useful = 5).

The survey included both quantitative and open-ended questions. The open-ended responses were analyzed using thematic analysis, following the guidelines outlined by Braun and Clarke (2006). A codebook was created to ensure consistency and clarity in the analysis, with definitions and examples for each code. Two researchers with advanced academic training (RA, PhD, and ED, MS), both of whom received academic training in qualitative analyses, independently coded the responses and used the codebook as a reference to identify recurring themes. Discrepancies in coding were resolved through discussion until consensus was reached. Quantitative data were analyzed to assess the perceived usefulness of specific kit items. Descriptive analyses and independent sample *t*-test were performed using IBM SPSS Statistics for Windows, Version 28.0.1.1 (IBM Corp., Armonk, NY). Although no formal hypotheses were specified a priori, *t*-tests were used in an exploratory manner to examine potential differences in usefulness ratings of each kit item between family child care providers and other CACFP stakeholders. These exploratory comparisons offer early insight into subgroup perspectives that may guide future revisions and targeted resource development. The Institutional Review Board (IRB) of the University of Mississippi has reviewed this project and determined it to be exempt, Protocol #Q24-041. Electronic consent was obtained from all participants.

RESULTS OF ACTIONS:

Fifty-three states and territories ordered and received kits. 67.92% of states/territories responded to the survey. The digital feedback survey yielded 370 responses, constituting an 18.5% response rate and capturing feedback from 36 U.S. states and territories. Among these, the vast majority (approximately 78%) were individual family child care providers, while the remaining responses came from stakeholders including CACFP sponsors, state agency personnel, training consultants, and program administrators.

Family child care providers reported caring for varying numbers of children, with many (65.5%) caring for eight or more at a time. According to (ChildCare.gov, n.d), the highest supervision ratio for staff to children ages 4–5 is 1:8, which guided our use of "eight or more" as a meaningful cutoff to reflect the highest number of children typically allowed in a family child care home.

All components of the kit received favorable evaluations. On average, respondents rated the individual kit items between moderately useful and extremely useful. The food thermometer (mean = 4.21) and the insulated tote (mean = 4.29) emerged as the most valued components among family child care providers, reflecting their immediate and tangible utility in day-to-day food preparation and transport. Stakeholders, on the other hand, tended to assign even higher ratings across all items, particularly educational materials such as the handwashing poster and safety guide (Table 1).



Table 1. Archived Images: Main Dish by Meat Source, Appearance, and None Left (All Consumed) After Meal.

Characteristics	Family Childcare Provider		Other CACFP Stakeholders		Total		P-value
	N=287 (77.6%)		N=83 (22.4%)		N=370 (100%)		
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
Appliance thermometers	4.11	0.96	4.58	0.75	4.24	0.94	<0.01
Cooking temperatures magnet	3.92	1.03	4.52	0.69	4.08	1	<0.01
Feeding Infants Safely booklet	3.45	1.16	4.3	0.81	3.66	1.15	<0.01
Food thermometer	4.21	0.88	4.63	0.62	4.32	0.85	<0.01
Handwashing poster	3.75	1.18	4.4	0.69	3.9	1.11	<0.01
Insulated tote	4.29	0.9	4.53	0.74	4.35	0.87	<0.05
Keeping Children Safe guide	3.86	1.04	4.52	0.58	4.03	0.98	<0.01
Pen	4.07	0.99	3.99	1.08	4.06	1.02	0.56

Note: P-values are based on independent sample t-tests comparing average usefulness ratings

In analyzing the open-ended responses, several usage patterns emerged. Providers reported using the kit to reinforce daily routines, monitoring internal cooking temperatures, ensuring refrigerator and freezer safety, promoting handwashing among children, and transporting fresh foods on field trips or to and from grocery stores. In addition to practical use, Thirty-one participants mentioned that the items helped them explain food safety practices to assistants, parents, and even licensing inspectors (Table 2).

Table 2. Meat Alternate (M/MA) by Appearance* and Percent of Online Menus.

Main Theme	Subtheme	Number of Responses	Example Quotes
General Use	Used daily/ in childcare	66	<i>"I use it daily." #</i> <i>"Used it every day." #</i> <i>"I use it on a daily basis when cooking food for children" #</i> <i>"In our everyday operation" *</i> <i>"I used everything in the kit." #</i> <i>"Yes, I used the kit. All the items came in handy. Thank you for the kit." #</i>
	Used everything	28	<i>"I have been able to use every item in the bag. Loved it!" #</i>
	Used as intended	17	<i>"I used the items as they should be used." #</i> <i>"Applied everything the way it should be used" #</i> <i>"I loved it. Wish I could get more and hand out to parents." #</i>
	Helpful	10	<i>"Very useful tools" #</i> <i>"Sent copies of information to parents." #</i>
Enhanced Food	Training/ Learning/ Resource	26	<i>"Made copies and shared with new moms in my care and with toddlers and preschool parents in my care." #</i> <i>"The kit was used during training sessions with staff and CACFP Program Operators." *</i> <i>"I use it as a training tool for my providers." *</i> <i>"We used them during our food safety trainings." *</i>
	Teach children	15	<i>"Help to teach the children ways to stay safe and healthy." #</i> <i>"Learning unit for the kids." #</i>
	Inspections	4	<i>"I use appliance thermometers in freezer and refrigerator They both are used for food inspections." *</i> <i>"Put the food thermometer in food to test for temp level." *</i>
	Gave to families	21	<i>"I shared info with parents and gave a few things to parents as well." #</i> <i>"I shared the infant eating booklet with a parent..." #</i> <i>"The kits were distributed to parents during our Health Fair" *</i>

Main Theme	Subtheme	Number of Responses	Example Quotes
	Gave away kits/parts of kit	5	<i>"I already had thermometers in my fridge...so I gave them to other providers without thermometers." #</i> <i>"Gave out information that I learned. Thank you so much." #</i> <i>"Give to Day Care Home providers during our annual training" *</i> <i>"Provided to home child care providers upon CACFP Reviews." *</i> <i>"I gave out the kits to the Day Care Home Providers and Head Start Centers, which are under our sponsorship." *</i> <i>"Distributed them to our FCC and Center sites" *</i> <i>"We gave them to providers as an incentive gift" *</i> <i>"Gave to all providers in my region" *</i>

**Other CACFP Stakeholder, #Family child care provider*

Twenty-six stakeholders reported using the kit in professional development sessions, staff training workshops, and as onboarding tools for new providers. Themes that emerged from qualitative responses included appreciation for a resource designed specifically for home-based care, recognition of the unique needs of family child care environments, and a sense of increased professionalism. Providers described the materials as practical, attractive, and user-friendly. Some indicated that receiving the kit improved their confidence in handling food safely and reinforced their professional identity.

Importantly, the kit was seen as a form of validation. Eighteen participants expressed that, in an often-overlooked segment of early childhood education, receiving a free, professionally developed kit felt empowering. One respondent noted, *"This was the first time I received something made specifically for providers like me,"* while another said, *"The kit made me feel recognized and supported."*

Some providers reported that the kit facilitated better communication with parents regarding food safety expectations. For instance, posters were displayed in kitchens or entryways as gentle reminders for families, while printed materials were used to explain why certain food handling procedures were followed. Additional figures and tables supporting the analysis are provided in the supplementary file. Supplementary Table 1 outlines the survey phases and response rates during kit development. Supplementary Tables 2–4 expand on the thematic analysis: Table 2 presents how participants reported using specific kit items; Table 3 summarizes general feedback about the kit as a whole; and Table 4 highlights what participants liked about individual kit items.

APPLICATIONS:

Kit items such as the insulated tote and food thermometer were frequently highlighted for their practicality. This emphasized their role in addressing everyday challenges in family child care settings. For example, the insulated tote enabled safe food transport during grocery shopping and field trips, while the food thermometer helped ensure compliance with cooking and storage temperature guidelines. These findings align with research emphasizing the importance of practical resources in mitigating foodborne illnesses in childcare environments (Green et al., 2005; United States Department of Agriculture, 2015, 2017, 2020). For example, providers can use the insulated tote along with ice packs to keep perishable items at safe temperatures below 41°F, as recommended by the CDC and USDA Food Safety Inspection Service. Although research is available on general recommendations for using insulated bags for food safety, formal research on providing insulated food safety tools to family child care providers is limited, public health agencies such as the USDA recommend the use of insulated bags to ensure safe food transport and storage (Centers for Disease Control and Prevention, 2015; United States Department of Agriculture, 2016).

These findings have important implications for practitioners, program designers, and policy makers working in early childhood education and food safety. The fact that family child care providers consistently rated tangible items like thermometers and insulated totes as most useful suggests that hands-on tools can significantly strengthen compliance with food safety regulations, especially in under-resourced settings where access to training and materials is limited. These results support the value of distributing practical, low-cost materials alongside educational guidance to improve safety outcomes in home-based care.

Stakeholders such as CACFP sponsors and state agencies may consider integrating similar toolkits into training, onboarding, or technical assistance efforts. For researchers, this study highlights a need to assess whether tools like these lead to sustained changes in food handling behavior and ultimately reduce risk of foodborne illness. The inclusion of educational materials, such as handwashing posters and food safety guides, provided family child care providers with accessible knowledge to implement safe food practices effectively. Such resources are critical for supporting family child care providers, who often face barriers to accessing formal food safety training (Paez & Alcorn, 2019).

Although stakeholders were not the primary audience for the kit, their input provided valuable insights into its broader applications. Stakeholders, including CACFP sponsors and state agencies, reported using the kit for training sessions and compliance monitoring. This feedback highlights the potential for resources like the kit to support not only family child care providers but also the stakeholders who provide oversight and training (Bromer & Henly, 2009; Paez & Alcorn, 2019). While their role was secondary in this study, stakeholders' engagement shows the importance of considering their perspectives when scaling similar interventions. The kit also addressed a critical gap in resource availability for family child care providers, who often operate with limited resources and feel overlooked compared to larger childcare centers. Family child care providers expressed a sense of acknowledgment and validation upon receiving the kit, which they perceived as specifically designed to meet their unique needs. This sense of recognition aligns with previous research that

highlighted the importance of tailored resources in empowering underrepresented childcare providers (Bromer & Henly, 2009).

The study has some limitations that should be acknowledged. The survey was distributed to individuals who had ordered the kit, primarily through sponsors. These sponsors often act as intermediaries between providers and program resources. As such, not all family child care providers who received the kit may have been reached directly by the survey. However, the ICN's *Family Child Care Food Safety Kit* accomplished its intended purpose of being a useful, informative, and applicable food safety educational tool for the family child care audience.

Next Steps

The food safety kit was an important and valued resource for family child care providers, offering both essential tools—such as thermometers and insulated totes—and professionally developed educational materials. Participants reported that the kit supported their day-to-day food safety practices and contributed to a sense of being recognized and supported. However, due to the cost associated with producing and distributing physical kits on a broad scale, future efforts should explore adapting the kit's educational content into low-cost or freely accessible formats. Potential next steps include developing short training videos or virtual training modules to supplement or replace physical materials. Future research could also investigate the long-term impact of the kit and other educational tools on behavior change and the sustainability of improved food safety practices in family child care settings.

DECLARATIONS

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ABSTRACT

IDENTIFICATION OF THE PROBLEM/CHALLENGE

Food safety within Child and Adult Care Food Program (CACFP) sites requires strict adherence to regulations and guidelines to mitigate the risk of foodborne illness outbreaks. These regulations necessitate protocols such as proper handwashing, temperature control, cleaning, and sanitation to ensure the safety of meals served to vulnerable populations. This study evaluated the acceptance and usage of the Family Child Care Food Safety Kit, developed by the Institute of Child Nutrition (ICN), among family child care providers and other stakeholders, such as state agencies and sponsoring organizations. While family child care providers were the primary audience, stakeholders provided valuable perspectives on the kit's broader utility and application.

ACTIONS TAKEN

After the development and the distribution of the ICN Family Child Care Food Safety Kit, a digital survey in 2021 gathered data on respondent demographics, perceptions of the kit's usefulness, and feedback.

RESULTS OF ACTIONS

A total of 370 respondents from 36 states and territories participated, with 77% being family child care providers. The insulated tote and food thermometer received the highest ratings. Stakeholders rated the toolkit's usefulness higher than family child care providers. The kit was used for daily practices, training, and inspections.

APPLICATIONS/NEXT STEPS

The kit was well received, with items such as the food thermometer and insulated tote frequently rated as most useful. These tools supported food safety compliance by helping providers monitor temperatures and maintain cold food storage during transport—critical functions in reducing foodborne illness risk in home-based settings. For child nutrition sponsors, state agencies, and early care educators, the findings highlight the importance of pairing practical tools with training materials to strengthen food safety capacity in under-resourced environments. More research is needed to assess its effectiveness in improving food safety behaviors before broader adoption. Providing essential equipment, like thermometers and insulated totes, alongside training materials, can address gaps in compliance with food safety standards.

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FNS Research Corner Summary of Research

▪ Susannah Barr, Ph.D.; Child Nutrition Research and Analysis Division

The FNS Research Corner is a continuing series summarizing recently completed and current research in child nutrition conducted by the U.S. Department of Agriculture's Food and Nutrition Service (FNS). Links to published studies and reports, as well as descriptions of ongoing studies, are available on the FNS website at <https://www.fns.usda.gov/research-analysis>.

RECENTLY COMPLETED RESEARCH ON SCHOOL MEALS

2023 Farm to School Census

This study collected information on farm to school participation by school food authorities (SFAs) in school year (SY) 2022–23. Every SFA participating in the National School Lunch Program in the 50 states, District of Columbia, and five territories received an online survey asking about the farm to school activities they participated in, details of their participation, and their perspectives on farm to school. Past Farm to School Census surveys were conducted in 2013, 2015, and 2019.

Key Findings

- Nearly three-quarters (74 percent) of SFAs participated in at least one farm to school relevant activity in SY 2022–23, an increase of 9 percentage points over SY 2018–19.
- Nearly two-thirds (63 percent) of SFAs said they served local foods to students in SY 2022–23.
- SFAs participating in farm to school spent almost \$1.8 billion on local purchases, representing about 16 percent of their total food spending. Fluid milk purchases made up about half of local spending at \$955 million.
- A variety of positive outcomes were reported by SFAs that participated in farm to school, including an increase in consumption of fruits and vegetables in school meals (61 percent of participating SFAs), access to better quality foods (57 percent), and an increased positive perception of the school food program among educators (49 percent).
- Some SFAs reported they had challenges with Farm to School, most notably availability of local foods (42 percent of participating SFAs) and cost of local foods (35 percent).
- SFA engagement in farm to school grew in spite of challenges from COVID-19.
- Links to data sets and more information are available:
<https://www.fns.usda.gov/research/f2s/census2023>



Bringing Local Foods to Students: Achievements and Learnings from USDA Farm to School Grantees

The [Patrick Leahy Farm to School Grant Program](#) awards grants to support schools, non-profits, Indian Tribal Organizations (ITOs), state agencies, producers, and other entities that are planning, developing, and/or implementing farm to school programs. These programs serve local foods and provide education on food and agriculture to children in schools, childcare settings, and summer meal sites. This report presents findings from the FNS evaluation of the fiscal year (FY) 2018 and FY 2019 Farm to School grantees, highlighting their activities, achievements, and challenges. Grantee project duration varied, but many projects extended through school year 2020–21. A [2021 report](#) evaluated Farm to School grantees from FY 2013 through 2017.

Key Findings

- FY 2018 and FY 2019 Farm to School grants supported more than 1,000 school districts and close to 9,000 schools across the U.S., including territories and ITOs.
- Grant-funded projects facilitated greater community support for school meals and higher student participation.
- Grantees found new sources for local foods and made more local food purchases. They also saw positive changes in staff attitudes toward incorporating fresh, local foods.
- Due to grant funding, at least 179,000 students benefited from taste tests; 145,000 from edible school gardening or orchard activities; 42,000 from farmer visits; and 28,000 from field trips to farms.
- Grantees trained more than 4,700 teachers, 4,500 foodservice staff, and 1,100 farmers as part of grant projects.
- Grantees were largely able to accomplish their project objectives, despite the challenges presented by the COVID-19 pandemic.

The final report is available here: <https://www.fns.usda.gov/research/f2s/grantees-fy18-19>

SFA Survey III on Supply Chain Disruption and Student Participation (SY 2023–24)

FNS developed a survey series to get timely and up-to-date information from school food authorities (SFAs) about ongoing supply chain challenges and their impacts on school meal operations. This report includes findings from the third survey in this series. The first was published in March 2022 and the second in July 2023. As in previous years, a 20-minute online questionnaire was sent to all SFAs operating child nutrition programs in schools to gather information on the impacts of continued supply chain challenges.

Key Findings

- Almost all (95 percent) SFAs faced supply-chain related challenges in school year (SY) 2023–24.
- However, there were signs of improvement. The number of reported challenges and impacts on school foodservice in SY 2023–24 largely declined, compared to SY 2022–23.
- One notable exception: SFAs were more likely to report increased labor costs as a challenge (40 percent of SFAs in SY2023–24, up from 31 percent in SY 2022–23).



- SFAs used various strategies to address supply-chain related challenges. Almost a third (32 percent) of SFAs increased their use of scratch cooking, and more than one in five SFAs (21 percent) increased local food purchases.
- The final report is available here: <https://www.fns.usda.gov/research/schoolmeals/sfa-survey3-scd>
- Data and visualizations are available on the School Foodservice Supply Chain Challenges Dashboard: <https://www.fns.usda.gov/data-research/data-visualization/school-foodservice-supply-chain-challenges-dashboard>

Child Nutrition Program Operations During the COVID-19 Pandemic—July 2021 Through September 2022

Through this study, state agencies met their [Families First Coronavirus Response Act](#) (FFCRA) reporting requirement and helped us understand child nutrition program operations during the third school year and summer of the pandemic. The study team surveyed state agencies about waiver usage during the 2021–22 school year and summer 2022 and collected program data about schools, sites, and outlets that participated in child nutrition programs.

Key Findings

- The child nutrition programs served more meals during school year 2021–22 than during the first two school years of the pandemic (2020–21 and 2019–20).
- The child nutrition programs served fewer meals during summer 2022 than during the first two summers of the pandemic.
- Every child nutrition state agency used two or more of the waivers and flexibilities provided by FNS during this period. They also reported that waivers improved services to children.
- More information available here: <https://www.fns.usda.gov/research/cn/pandemic-operations-july2021-sept2022>

RECENTLY COMPLETED RESEARCH ON CACFP

Characteristics of Emergency Shelters Participating in the CACFP

[Emergency shelters](#) have been eligible to participate in the Child and Adult Care Food Program (CACFP) since July 1999, when the Homeless Child Nutrition Program was integrated into CACFP. Children and some adults with disabilities who are homeless and temporarily reside at an emergency shelter are eligible to receive up to three free meals per day through CACFP. This report describes findings from the first national study of emergency shelters participating in CACFP. The objective of this study was to gain a general understanding of the characteristics of CACFP emergency shelters, who they serve, how CACFP fits into their operations, and their challenges with CACFP.

Key Findings



- Emergency shelters represent just 0.25 percent of CACFP participating sites. From March 2020 to September 2022, CACFP emergency shelters claimed approximately 234,000 meals per month on average.
- Most CACFP emergency shelters operate 365 days per year.
- More than half of CACFP emergency shelters reported that residents stay an average of 90 days or less.
- Less than half of CACFP emergency shelters also provide childcare.
- About half the population served at shelters are adults whose meals may not be eligible for reimbursement under CACFP.
- Most CACFP emergency shelters specialize in working with one or more of the following populations: victims of abuse, families, migrants, or youth.
- This component of CACFP can play an important role in disaster recovery. The [full report](#) includes an example of how CACFP emergency shelters were used to support families after Hurricane Harvey in 2017.
- Read more here: <https://www.fns.usda.gov/research/cacfp/emergency-shelters>

Characteristics of Adult Day Care Centers that Participate in CACFP

Adult day care centers have been eligible to operate the [Child and Adult Care Food Program](#) (CACFP) since 1987. Adult day care centers receive payments for serving nutritious meals to adults who are age 60 or older, or who are physically or mentally impaired to an extent that limits their independence and ability to carry out activities of daily living. Centers may receive reimbursements for up to two meals and one snack per participant per day. See the [CACFP Adult Day Care Handbook](#) for more information about the program. The objective of this study was to better understand key characteristics of adult day care centers participating in CACFP. Key characteristics include: 1) the types of organizations that participate in CACFP as adult day care centers and the populations they serve; and 2) the meal services and non-meal services offered at CACFP adult day care centers.

Key Findings

- The number of adult day care centers participating in CACFP varied widely from state to state and was not always proportional to the state's population of older adults and people with disabilities. More than half of the 2,495 CACFP-participating adult day care centers in FY 2023 were in just five states: Texas, California, Florida, New Jersey, and New York.
- About half of centers operated CACFP independently, while fewer centers had a sponsoring organization that supported the administration of CACFP.
- Just over half of centers identified themselves as private, for-profit organizations. These for-profit centers accounted for about 72 percent of all meals claimed in the adult daycare component of CACFP in October 2023.
- Compared to non-profit centers, for-profit centers were significantly more likely to claim free meals (versus reduced-price or paid) and to serve a larger proportion of adults over age 60.
- Other significant differences between for-profit and nonprofit centers are described here: <https://www.fns.usda.gov/research/cacfp/characteristics-adc>



Family Day Care Home Participation Study

This study is the first national study to focus on reasons for Child and Adult Care Food Program (CACFP) participation by comparing current and former CACFP family day care homes (FDCHs). The study spans 2019–2023 and provides a unique look at FDCHs during the COVID-19 public health emergency. The study identified: 1) challenges and barriers FDCH providers participating in CACFP face; and 2) recommendations from current and former FDCH providers to address those challenges. In addition to differences by CACFP enrollment status, the study examined differences by urbanicity (urban/rural) and program size (large/small) among the former and current CACFP providers.

Key Findings

- Of the Family Day Care Home (FDCH) providers who left CACFP after 2019, over 70 percent no longer operated in 2022. The evidence suggests that declines in CACFP participation may result from declines in FDCH providers.
- Current and former providers alike viewed CACFP positively, finding the program easy to enroll in and praising it for helping provide food to more children.
- At least two-thirds of current and former providers cited CACFP's training and technical assistance as a benefit of participation.
- Seventy percent of former providers and 62 percent of current providers reported one or more challenges with CACFP. The most frequently reported challenge for both groups was that reimbursements did not cover food costs. This aligns with the program's intent, by law, to offset – rather than fully cover – food costs.
- Challenges related to paperwork and administrative tasks were more commonly reported by former participants than current participants.
- More information is available here: <https://www.fns.usda.gov/research/cacfp/fdch-participation>.

USDA Child and Adult Care Food Program Participation Among U.S. Childcare Providers

The analysis in this report uses data from the 2019 National Survey of Early Care and Education (NSECE) to compare the general characteristics of childcare centers and day care homes by CACFP participation status and eligibility. The NSECE is a nationally representative survey of childcare providers sponsored by the Office of Planning, Research and Evaluation (OPRE) in the Administration for Children and Families of the U.S. Department of Health and Human Services. The analysis also uses a follow-up survey to understand how the COVID-19 pandemic affected provider operations and CACFP participation.

Key Findings

- In 2019, 61 percent of eligible childcare centers and 67 percent of eligible day care home providers participated in CACFP.
- CACFP-participating centers and homes were more likely than those not participating to serve children experiencing food insecurity at home.
- CACFP-participating providers were more likely to serve populations experiencing economic disadvantage.

- CACFP-participating homes and centers were more likely to use a curriculum or prepared learning activities.
- Most CACFP providers that operated in 2019 were still operating in October 2020 during the pandemic, though centers were more likely to remain open than homes. All centers and homes that were still operating continued to participate in CACFP.
- The final report is available here: <https://www.fns.usda.gov/research/cacfp/provider-participation>.

The study team also completed a systematic review that was [published in a peer-reviewed journal](#) in March 2025. The systematic literature review examined studies covering several CACFP-related topics and synthesized findings into key themes for each topic.

Erroneous Payments in Childcare Centers Study (EPICCS)

The [Payment Integrity Information Act of 2019](#) requires federal agencies to estimate information about payment errors for federal programs. The Child and Adult Care Food Program (CACFP) operates in several types of childcare settings, each of which have slightly different rules that impact payment error estimates. EPICCS estimated payment errors in CACFP childcare centers that primarily care for children between the ages of two and five.

Key Findings

- Certification error, which occurs when a child is certified based on their household income at the wrong level for purposes of reimbursement, was highest for children certified for reduced-price meals and lowest for children certified for free meals. Certification error was about equally divided between over-certification and under-certification, and household reporting error was a more common cause of certification error than administrative error.
- The rate aggregation error, which occurs when the wrong number of meals is totaled together and sent forward for reimbursement, was very low. Most childcare centers claimed the correct number of meals for reimbursement, while a small number of childcare centers had relatively high error rates.
- When childcare centers did not meet USDA meal pattern requirements in the CACFP meals they served, it was more often because they served the wrong portion sizes than because they had incorrect or missing meal components. The meal component that was incorrect most often was whole milk (instead of low- or non-fat milk).
- More information about the study is available here: <https://www.fns.usda.gov/research/cacfp/epiccs>.
- Study data is available for use by independent researchers here: [https://agdatacommons.nal.usda.gov/articles/dataset/Erroneous Payments In Childcare Centers Study EPICCS /28256033](https://agdatacommons.nal.usda.gov/articles/dataset/Erroneous%20Payments%20In%20Childcare%20Centers%20Study%20EPICCS/28256033).

Feasibility Study: Calculating Meal Claiming Error in Family Day Care Homes That Participate in CACFP Using State Monitoring Review Data

This study explored the feasibility of using existing data from state monitoring reviews – a process designed to assess operations and provide real-time technical assistance to family day care homes operating CACFP – to estimate the rate of improper payments and assess CACFP’s compliance with the Payment Integrity Information Act.

Key Findings

- State agencies have flexibility under current CACFP guidelines regarding how they conduct reviews and document findings. These allowable state-level variations result in differences in the available data and documentation across states.
- These state-level variations made the resulting data unusable for estimating improper payments.
- More information is available here: <https://www.fns.usda.gov/research/cacfp/meal-claiming-error-methods-study>.

Study of Nutrition and Activity in Childcare Settings II

The Study of Nutrition and Activity in Childcare Settings (SNACS-II) is the second comprehensive study of CACFP that examines the characteristics of providers and participants, the food and nutrition content of meals and snacks, operating costs, and many other program topics. The first iteration of the study (SNACS-I) collected data in program year 2016–17. That same year USDA updated the CACFP meal pattern requirements for the first time since the program’s inception in 1968. The [updated meal patterns](#) require a larger variety of fruits and vegetables, more whole grains, and less added sugar and saturated fat and have been in effect since program year 2017–18. With data collected in program year 2022–23, SNACS-II illustrates whether the nutritional quality of CACFP meals and snacks and children’s diet quality changed with the new meal pattern requirements and provides an update on other key findings from the first study.

Key Findings

- When in the care of providers participating in CACFP, children’s diets were healthier. They consumed more vegetables, fruits, whole grains, and dairy on days they were in care versus days they were not. They also consumed fewer calories from saturated fats and added sugar.
- For children ages 3 to 5 years in early childcare programs, [Healthy Eating Index \(HEI\)](#) scores for all meals and snacks served rose 5 points from SNACS-I to SNACS-II. For children ages 6 to 12 years in before-and-afterschool programs, HEI total scores for snacks and suppers increased 7 points from SNACS-I to SNACS-II.
- Most of the cost to produce meals served in childcare centers is due to labor costs rather than food costs. On average, labor costs accounted for 77 percent of total breakfast costs, 67 percent of total lunch costs, and 81 percent of total snack costs.

RECENTLY COMPLETED RESEARCH ON CACFP

2023 Summer Non-Congregate Meal Service Sponsor Survey

Until 2020, meals served through the Summer Food Service Program (SFSP) and the Seamless Summer Option (SSO) of the National School Lunch Program were required to be eaten in a congregate, or group, setting on the meal site premises. The Consolidated Appropriations Act, 2023 permanently authorized a non-congregate meal service option for operators of SFSP and SSO in qualifying rural areas, beginning in summer 2023. This preliminary evaluation sought to understand: 1) sponsors' perceptions of the impacts of the non-congregate meal service option; 2) how sponsors implemented non-congregate meal service in summer 2023; and 3) sponsors' plans for summer 2024 non-congregate meal service. Some program rules were [modified for summer 2024](#) and beyond.

Key Findings

- Overall, sponsors of summer non-congregate meal service sites in 2023 viewed the program positively, indicating that they were able to provide more meals to more children at a cost less than or equal to congregate meal service.
- Sponsors provided non-congregate meals through meal pick up (79 percent), meal delivery (6 percent), or a combination of both (15 percent). Most also used at least one other available flexibility (parent/guardian pick up, multi-day meal issuance, and/or bulk food distribution).
- Most sponsors planned to sponsor non-congregate meal sites again in summer 2024. One-fifth planned to expand non-congregate meal service by adding more sites and/or serving more meals.
- More information is available here: <https://www.fns.usda.gov/research/sunmeals/non-congregate/sponsor-survey23>.

RECENTLY COMPLETED RESEARCH ON SUMMER NUTRITION PROGRAMS

2023 Summer Non-Congregate Meal Service Sponsor Survey

Until 2020, meals served through the Summer Food Service Program (SFSP) and the Seamless Summer Option (SSO) of the National School Lunch Program were required to be eaten in a congregate, or group, setting on the meal site premises. The Consolidated Appropriations Act, 2023 permanently authorized a non-congregate meal service option for operators of SFSP and SSO in qualifying rural areas, beginning in summer 2023. This preliminary evaluation sought to understand: 1) sponsors' perceptions of the impacts of the non-congregate meal service option; 2) how sponsors implemented non-congregate meal service in summer 2023; and 3) sponsors' plans for summer 2024 non-congregate meal service. Some program rules were [modified for summer 2024](#) and beyond.

Key Findings

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- More information is available here: <https://www.fns.usda.gov/research/sunmeals/non-congregate/sponsor-survey23>.

RESEARCH IN PROGRESS

Expected in 2025

School Food Preparation Study

Due to increasing interest in serving more local and scratch-cooked foods in school meals, this project aims to understand food preparation methods used by school food authorities (SFAs) and how SFAs incorporate fresh food preparation into their operations. Case study data was collected from a diverse set of 36 SFAs during school year 2024–25. The findings from this study may be used to create resources and technical assistance to help SFAs include fresh food preparation in their operations more easily. The final report is expected in fall 2025.

SFA Survey on Supply Chain Disruption and Student Participation (SY 2024–25)

The School Food Authority (SFA) Survey IV on Supply Chain Disruption and Student Participation is the fourth and final survey in a series examining the impacts of the COVID-19 pandemic on school food operations. This survey was administered by FNS from January 27, 2025, to March 14, 2025, through a 20-minute online questionnaire. The survey was sent to all SFAs operating child nutrition programs during the regular school year. The results and published report, along with associated updates to the [School Foodservice Supply Chain Challenges Dashboard](#), are expected in Fall 2025.

2024 Non-Congregate Meal Service Data

FNS uses data submitted by state agencies via the Report of the Summer Food Service Program for Children (FNS-418) and the Report of School Program Operations (FNS-10) to monitor the Summer Food Service Program (SFSP) and the Seamless Summer Option of the National School Lunch Program (SSO). After the Consolidated Appropriations Act, 2023, authorized the non-congregate meal service option for SFSP and SSO, FNS began developing permanent monitoring tools and procedures



for the new program option. Modifications to the FNS-418 and the FNS-10 forms were completed in May 2024, but state agencies were given until 2025 to begin submitting non-congregate meal service data. This project evaluated state agencies' capacity to complete the new versions of the FNS-418 and the FNS-10 forms through an online survey platform and allowed them to request technical assistance throughout the data collection period. Feedback from state agencies led FNS to provide additional training and give state agencies until 2026 to provide some of the more challenging data elements. The data collected also allows FNS to examine changes in non-congregate meal service participation from 2023 to 2024. The report and the state-level dataset are expected to be available by the end of 2025. Program data for summer 2025 and onwards will be captured through the FNS-418 and FNS-10 forms and published in routine data releases from FNS.

Expected in 2026 and Beyond

Access, Participation, Eligibility and Certification Study IV

The fourth study on Access, Participation, Eligibility and Certification (APEC IV) will provide key information on annual error rates and improper payments for the National School Lunch Program and School Breakfast Program. In addition, APEC IV will identify school food authority, school, and student/household characteristics that may be related to errors; test a new method of using cameras to collect meal observation data; and explore the accuracy of certification decisions made using different types of applications. Data collection concluded in summer 2024, and publication is expected in late 2026.

2024–25 National School Foods Study

The 2024–25 National School Foods Study (NSFS) — a combination of the School Nutrition and Meal Cost Study-II (SNMCS-II) and School Food Purchase Study-IV (SFPS-IV)—will be the newest contribution to the two ongoing study series that examine topics such as the nutritional quality of meals, meal costs, student participation, plate waste, and school food purchase practices.

This study will produce data about the school food environment, foodservice operating policies and practices, student participation, and other characteristics of school food authorities (SFAs) and schools participating in the National School Lunch Program, School Breakfast Program, and the Fresh Fruit and Vegetable Program. This data may be used to develop national estimates for the cost of food purchases and to understand the mix of program and non-program foods purchased by SFAs in comparison to previous studies.

2027 Farm to School Census

The 2027 Farm to School Census will collect data from a national census of school food authorities (SFAs) in school year 2026–27 to better understand the characteristics of SFAs participating in farm to school and the scope and details of the activities they engage in. The Census will be distributed to all public and private SFAs (including residential childcare institutions) participating in the National School Lunch Program in the 50 states, American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the U.S. Virgin Islands, and District of Columbia. The primary mode of data collection will be an online survey distributed to SFA directors. The 2027 survey will be very similar to the 2023 survey to allow for comparisons of trends across time.

CHILD NUTRITION DASHBOARD

FNS's public-facing Child Nutrition Dashboard provides a user-friendly platform for the public to access data published monthly in the child nutrition tables. Users can examine national- and state-level visualizations of meals served, participation, and funding data for the National School Lunch Program, School Breakfast Program, Child and Adult Care Food Program, and Summer Food Service Program. The dashboard can be used by federal, state, and local organizations to assess trends in child nutrition programs from 1990 through 2024. The dashboard was developed with extensive stakeholder feedback to ensure it was designed to meet users' interests and needs.

Access the Child Nutrition Dashboard here: [Child Nutrition Dashboard | Food and Nutrition Service \(usda.gov\)](https://www.fns.usda.gov/child-nutrition-dashboard)

CHILD NUTRITION RESEARCH GRANTS

School Foodservice Workforce Cooperative Agreement

This cooperative agreement, awarded to the University of Wisconsin in April 2024, will support research projects to better understand and generate information related to the school foodservice workforce, focused on factors such as worker satisfaction, workforce experience, and training and development. Relevant research activities may include, but are not limited to, examining career pathways for the school foodservice workforce, identifying skills used on the job by role, and analyzing worker satisfaction and workplace conditions. A competition for subgrants was held in early 2025, and awards are expected to be announced in spring 2025.



Institute of Child Nutrition Applied Research Division Research Update

▪ Marjuyua Lartey Gibson, PhD, RD

Marjuyua Lartey Gibson, PhD, RD

The Institute of Child Nutrition Applied Research Division (ICN ARD), funded through a grant administered by the United States Department of Agriculture Food and Nutrition Services, conducts ongoing research to enhance Child Nutrition Programs. For comprehensive reports on the Applied Research Division's projects, visit <https://theicn.org/research/>, where you can stay informed and engaged with the latest research in child nutrition from the Applied Research Division.

RECENTLY COMPLETED RESEARCH

Child Nutrition Rapid Online Survey Series

The ICN ARD developed a multi-year study to address issues and challenges impacting the child nutrition environment. The project included four rapid online surveys designed to address the following areas: a) Child Nutrition Program (CNP) challenges and support systems, b) culinary training needs of School Nutrition Program (SNP) professionals, c) training needs of SNP professionals, and d) training needs of Child and Adult Care Food Program (CACFP) professionals.

The final survey in the child nutrition rapid online survey series was completed in March of 2025. This survey focused on the training needs of CACFP professionals. Three hundred and eight individuals consented to participate in the research and completed the survey. The respondents included family home care providers, child care directors, CACFP sponsors, and Head Start nutrition administrators. The results of the research indicated that the most significant issues or challenges CACFP professionals face are related to the following: a) identifying resources and assistance to address the procurement of foods to meet children's special dietary needs (84.4% of the respondents), CACFP guidelines (84.1%), and finding fresh fruits and vegetables that meet their CACFP budget (82.8%), and b) addressing training needs including having time to train (63.3%) and finding local face-to-face CACFP training (58.4%).

The findings from this survey and the full report are available on the Institute of Child Nutrition's (ICN) website under the Applied Research Division's tab.

Competencies, Knowledge, and Skills for Chefs Working in School Nutrition Programs

In May 2025, the ICN ARD released the Competencies, Knowledge, and Skills (CKS) for Chefs Working in School Nutrition Programs' technical report and resource. The report and resource created an evidence-based competency framework that outlines the essential knowledge and skills required for chefs in SNPs. The resource



includes practical tools to support school nutrition administrators in hiring, retaining, and training school chefs. It includes items such as a job description template, a performance management template, and a career development template. A full report and the CKS resource are available on the ICN website.

RESEARCH IN PROGRESS

Program Operations Research

Meeting the Challenges of Serving Scratch-Prepared Foods in School Meal Programs

The study identifies the challenges school nutrition professionals face in offering scratch-prepared foods in schools, including exploring barriers such as cost, food quality control, compliance with nutrition standards, equipment limitations, staff skill levels, availability of local and traditional foods, and stakeholder demand. The survey to assess the challenges and drivers of serving scratch-prepared foods was completed in early May 2025. Data analysis is underway. The research is nearing completion, and the report and research findings will be available early Spring 2026.

Perceptions and Practices of Incorporating Student-Centered Menu Items in School Meals

This study aims to identify perceptions and practices for selecting and incorporating student-centered menu items in school meals. A survey was developed to assess student preferences and will be administered in Fall 2025. Keep an eye out for an invitation to participate in this timely research.

Meeting the Challenges of Serving Scratch-Prepared Foods in Child and Adult Food Programs

The purpose of this project is to identify: 1) the challenges affecting the ability of CACFP operators to provide scratch-prepared foods; 2) the extent to which these challenges are prevalent in CACFP sites across the U.S.; and 3) recommendations for strategies, techniques, and best practices to address these challenges. The initial phase of this research involved virtual interviews with CACFP operators, including child care sponsoring organizations, childcare centers, and family childcare providers. Following the interviews, a draft survey was developed and will be distributed nationally by early Spring 2026.

Exploratory Investigation of the Challenges and Drives for Serving Local Foods in Rural School Districts

The purpose of this project is to identify 1) the challenges affecting the ability of rural school districts to serve local foods; 2) the degree to which these challenges are prevalent in rural school districts in the United States; 3) key drivers related to serving local foods; and 4) sustainable strategies, resources, and best practices for serving local foods in rural school districts. The first phase of this research, virtual interviews with key stakeholders in school districts serving local foods, is complete. The next phase of this project will include an expert panel work group charged with validating the national survey designed to address the challenges and drivers of serving local foods in rural areas. The national survey is scheduled to be released in the Summer of 2026.

Human Resource Research

Competencies, Knowledge, and Skills for School Nutrition Directors

The CKS for School Nutrition Directors project aims to establish a comprehensive competency framework for school nutrition directors. School nutrition professionals participated in an expert panel meeting to confirm the competency, knowledge, and skill statements for directors in March of 2025. The next phase of this project will involve an expert panel meeting to validate the CKS statements. After the statements are validated, the CKS report and resource will be developed. These deliverables will be available on the ICN website in early Spring 2026.

Social Media for Child Nutrition Program Employee Training Across Generations

This project aims to understand the use of social media as a potential resource for CNP professionals to address the unique challenges that come with training and professional development among different generations. This project will involve focus group discussions and a survey to address the changing landscape of training needs among school nutrition professionals and their employers. The project will begin with focus group discussions in Fall 2025 and will solicit participation from current school nutrition directors, managers, and staff.

Customer Satisfaction

Revise and Validate ICN ARD High School Student's Participation and Satisfaction Survey

This project aims to revise and validate ICN ARD research-based tools to capture high school students' perceptions, behaviors, and recommendations on their participation and satisfaction with meals served under the School Breakfast Program and National School Lunch Program. The completion of this study will equip school nutrition administrators with the tools necessary to meet the changing expectations of the current student population at the local level, empower students with a voice to share their desires and expectations for the school food experience, and allow administrators the opportunity to pivot or adjust their offerings to encourage participation in school meals.

ACKNOWLEDGEMENTS

Recruiting and engaging school nutrition professionals is critical for the ICN ARD. The successful completion of each study depends entirely on CNP professionals' willingness to become involved and respond to requests for participation. We acknowledge that without the dedicated support of CNP professionals, the objectives of the research ICN ARD conducts cannot be fully achieved.

BIOGRAPHY

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