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Food Program Participation Influences Nutrition Practices in Early Care and Education Settings

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Abstract

Objective: To determine differences by *Child and Adult Care Food Program* (CACFP) participation on nutrition requirements and best practices and barriers to implementing both in early care and education programs (ECEs) stratified by context (centers vs home-based ECEs).

Design: Cross-sectional survey.

Setting: Three-thousand and fourteen licensed Nebraska ECEs in 2017.

Participants: One-thousand three hundred forty-five ECEs.

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Main Outcome Measures: Director-reported nutrition practices in classrooms serving children aged 2-5 years (8 requirements for foods served, 5 best practices for foods served, and 14 best practices for mealtime behaviors).

Analysis: Chi-square analysis adjusted for multiple comparisons.

Results: Of the sample, 86.8% participated in CACFP, 21.7% were center-based, and 78.3% were home-based. Overall, CACFP participation was related to the higher implementation of CACFP requirements for foods served ($P < 0.004$ for all) and receiving professional development on nutrition ($P < 0.012$). In home-based ECEs only, CACFP participation was related to a higher prevalence of serving meals family style ($P = 0.002$); however, these practices had low implementation overall.

Conclusion and Implications: Findings suggest strengthening of requirements to include staff mealtime behaviors beyond service of healthful foods. Improving CACFP enrollment and including CACFP standards in state licensing requirements may be key strategies for improving nutrition practices in ECEs.

Keywords: *Child and Adult Care Food Program*, child care, nutrition, policies, practices

Introduction

Dietary behaviors in youth, including consumption of adequate fruits and vegetables, can promote present and future metabolic health,[1,2] and the early childhood years are an important formative period for establishing lifelong dietary preferences and habits.[3–5] Early childhood care and education programs (ECEs) are promising for the promotion of health behaviors, with more than 60% of US children aged under 5 years attending ECEs in which they may spend up to 33–40 hours/wk.[6,7] The Child and Adult Care Food Program (CACFP) offers federal funding from the US Department of Agriculture Food and Nutrition Services through reimbursing costs of healthful food items in participating care facilities serving children from low-income families; ultimate goals are to provide nutritious meals for those at highest risk of hunger and food insecurity.[8] In 2018, more than 4.6 million people benefited from CACFP, with distributed reimbursement totaling more than $3 billion dollars.[9]

The CACFP requires particular food groups to be served to children aged 2 –5 years, while best practices are additionally promoted through CACFP-aligned educational guidance and materials. These best practices, although not required or formally regulated, are based on federal guidelines[10] with aims to promote consistency in programs

and create a healthier overall food environment within participating ECEs. Studies report a higher quality of food and beverages served[11–13] and healthier mealtime behaviors[11] in CACFP-participating programs than nonparticipants. However, there has been variability in the effectiveness of program compliance with CACFP guidelines,[12,14] suggesting a need to understand practice implementation and barriers nationally. Nebraska currently ranks fifth for childhood obesity in children aged 2–4 years.[15] Furthermore, CACFP provides reimbursement for 86% of ECEs throughout the state.[16] Therefore, this study aimed to determine differences by CACFP participation on nutrition requirements and best practices and barriers to implementing both, in Nebraska early care and education programs (ECEs) stratified by context (centers vs home-based ECEs).

Methods

Study Design

The Healthy Children, Healthy State Survey, was a cross-sectional study employed throughout the state of Nebraska in 2017 by self-administered surveys distributed to all licensed ECE facilities statewide (N= 3,014). This study was approved by the Institutional Review Board at the University of Nebraska–Lincoln. Consent was implied with the completion and return of the survey. Detailed methods have been previously published.[17]

Briefly, the response rate was 54.6%, with 1,592 surveys returned from contacted programs. Facilities were excluded from the analytic sample if they were not classified as centers or home-based ECEs (i.e., public schools and community programs) (n = 46) or Head Start programs (n = 56). Not only was the sample size limited for Head Start, but these programs have amore stringent requirement for performance standards and offer a different array of low-income family resources, [18] which makes them difficult to compare with other ECE contexts. Therefore, the final study sample included 1,490 eligible ECE programs.

Survey Instrument

The Healthy Children, Healthy State survey included an 86-item paper questionnaire distributed to ECE directors; notably, instruction included that responses should refer only to centers and classrooms serving children aged 2–5 years, and additionally indicated that if directors were unsure of an item, they could complete with the help of those most familiar with the program's classroom nutrition practices (i.e., teachers, kitchen staff, etc.). The survey included items to obtain information on the characteristics of the facility and classroom, including CACFP participation, nutrition education/training, and various information relating to CACFP-defined requirements and recommended best practices, including adherence, barriers, and difficulty of implementation. Items were drawn from previously published research with ECE providers,[19–22] and were reviewed by an expert advisory panel then piloted with 3 centers and home-based ECE providers. Further details on this process have been published previously.[23]

The survey included 5 items to assess CACFP-required standards and 6 items to assess recommended best practices for serving foods and beverages. To determine CACFP-required standards for serving fruits and vegetables at lunchtime, 2 questions served as proxies, specifically assessing serving fruits or vegetables at least 1 time/d. The survey also included 14 items to assess CACFP-recommended best practices for mealtime behaviors, including role-modeling, child engagement, and promoting child autonomy before and during mealtime. For each statement, the respondent indicated Yes or No to whether the program was currently participating in that practice. For each of these items, providers were also asked, How difficult is it to do (or potentially do)? To assess the level of difficulty of implementation, there were 4 possible responses, including Not at all difficult, A little difficult, Kind of difficult, or Very difficult.

The questionnaire included 13 separate items to assess possible barriers to implementing requirements and best practices for serving foods and beverages, and 9 items to assess possible barriers to implementing best practices for mealtime behaviors. Options for potential barriers addressed common limitations relating to finances, time, knowledge, efficacy, and more. For each statement, the respondent indicated Yes or No to whether they considered that barrier to

be a problem their program encounters. Finally, the survey included 4 items to assess involvement in nutrition training; the respondent indicated how regularly they received that training out of 4 possible responses, including Rarely or never, 1 time per month, 2–3 times per month, or 1 time per wk or more. In regard to professional development on child nutrition, the 4 possible responses were tailored to read Never, Less than 1 time per year, 1 time per year, or Two or more times per year. For professional development, this could include in-person or online training for contact hours or continuing education credits, but not training on food safety or food program guidelines.

Statistical Analysis

To address the primary aims of this study, Pearson chi-square test of independence was performed using SPSS (version 24.0, IBM Corp, 2016) to determine differences in best practice implementation, barriers, and difficulty level between those who do vs do not participate in CACFP, stratified by ECE context (centers vs homebased ECEs). Data are presented with the standard level of significance ($P \leq 0.05$) and after Bonferroni correction for multiple analyses.[24] Adjusted P values are indicated in footnotes of each table. Proportions of providers who responded Yes to whether the program was currently meeting best practices for serving food and beverages or mealtime behaviors were compared by CACFP participation; those who responded Not at all difficult for of each of these practices were also compared. Similarly, proportions of providers who responded No to experiencing barriers to best practice implementation were compared by CACFP participation, and proportion of those who do regularly engage in nutrition education were also compared.

Results

The final study sample included 1,490 respondents; after removing those with missing data on primary variables of interest (n = 145), the final analytic sample included 1,345 licensed ECE programs in Nebraska; 1,168 (86.8%) participated in CACFP (**Table 1**). Of the total sample, 394 (21.7%) were centers, and 1,053 (78.3%) were

home-based ECEs. Prevalence of CACFP participation was 50.2% and 92.1% in centers and home-based ECEs, respectively. Centers served more children in total than home-based ECEs, and across all contexts, the majority of children attending ECEs were White. The majority of center menus were planned by directors or site supervisors, whereas in home-based ECEs, the majority were planned by the owner or child care provider themselves. Overall, implementation of nutrition practices for serving fruits, vegetables, and whole grains were relatively high across ECEs, regardless of CACFP participation and context (78.5% to 99.5%). In contrast, implementation of recommended mealtime best practices, such as cuing children to their own satiety or refraining from using foods as a reward, were relatively low overall (25.9% to 62.9%).

In both centers and home-based ECEs, CACFP participation was related to a higher prevalence of implementing CACFP requirements and best practices for food and beverages served and lower self-reported difficulty implementing best practices (**Table 2**). In centers participating in CACFP as compared with non- CACFP centers, the prevalence of implementing CACFP-required standards for foods served differed; specifically, the prevalence was approximately 8% higher for serving fruit at least 1 time, 11.3% higher for serving vegetables at least 1 time, 22.3% higher for serving skim or 1% milk, and 28.4% higher for serving only unflavored skim or 1% milk ($P < 0.004$ for all) in CACFP participating centers. For home-based ECEs participating in CACFP as compared with non-CACFP homes, the prevalence was approximately 1.1% higher for serving fruit at least 1 time ($P = 0.027$), although this finding was not significant when considering adjustment for multiple comparison. However, prevalence was 3.1% higher for serving vegetables at least 1 time, 27.2% higher for serving skim or 1% milk, and 30.3% higher for serving only unflavored skim or 1% milk ($P < 0.004$ for all) in CACFP-participating homes compared to non-CACFP homes when considering the Bonferroni adjustment. Notably, after considering adjustment for multiple comparison, perceived level of difficulty implementing requirements remained significantly different by CACFP participation, in home-based ECEs only ($P < 0.004$ for all).

In centers and home-based ECEs, the prevalence of implementing CACFP-recommended best practices for foods served was mostly similar by CACFP participation status (Table 2). In centers specifically,

the prevalence in CACFP-participating sites was approximately 13.3% higher for preparing cooked vegetables without fat or butter compared with non-CACFP centers (P < 0.004). While prevalence was higher for serving lean or low-fat meat among CACFP-participating centers compared with those non-CACFP centers. However, this relationship was no longer significant when considering adjustment for multiple comparison (P = 0.03). Furthermore, in centers, perceived difficulty in implementing CACFP-recommended best practices did not differ by CACFP participation status. For home-based ECEs participating in CACFP compared with non-CACFP homes, the prevalence was approximately 9.5% higher for never serving sugary drinks. However, this relationship was no longer significant when considering adjustment for multiple comparison (P = 0.042). In addition, in homebased ECEs, CACFP participation was related to a higher prevalence of responding that the specific practice was not at all difficult for preparing cooked vegetables without fat or butter (P < 0.001).

Child and Adult Care Food Program participation influence on perceived barriers to practice implementation for food and beverages served are presented in **Table 3**. For home-based ECEs participating in CACFP compared with non-CACFP homes, the prevalence of reporting not enough money to cover to cost as a barrier was approximately 15.5% lower (P = 0.006). Unexpectedly, the prevalence of reporting a lack of support from other providers as a barrier was approximately 4.9% higher in homebased ECEs participating in CACFP compared with non-CACFP homes (P = 0.033). Neither relationship was significant when considering adjustment for multiple comparison.

Compared with CACFP requirements and best practices related to food and beverages served, few best practices for mealtime behaviors differed by CACFP participation (**Table 4**). In centers participating in CACFP, the prevalence of asking children if they are full before removing plates was approximately 8.2% lower than non-CACFP centers (P = 0.048). Furthermore, CACFP-participating centers experience a higher level of difficulty for role modeling eating healthy foods; specifically, in non-CACFP centers, the prevalence of responding that role modeling eating healthy foods was “not at all difficult” was higher compared with their CACFP-participating counterparts (P = 0.026). However, for home-based ECEs participating in CACFP as compared with non-CACFP homes, the prevalence of practice implementation

for role modeling eating healthy foods and serving meals family-style were 8.2% and 14.6% higher, respectively ($P < 0.05$ for all). This said, the only best practice to remain significantly different by CACFP participation after considering adjustment for multiple comparison was serving meals family style among home-based ECEs ($P = 0.002$). Among non-CACFP home-based ECEs, there was a higher prevalence of reporting that mealtimes with children were stressful compared with those CACFP-participating; however, results were not significant after considering adjustment for multiple comparison ($P=0.014$; **Table 5**) In both centers and home-based ECEs, CACFP participation was related to a higher prevalence of receiving professional development on nutrition $P < 0.012$ for both; (**Table 6**).

Discussion

This study described director-reported ECE program best practice implementation and associated barriers in Nebraska, in which prevalence of childhood obesity is particularly concerning.[15] Results presented include associations before and after considering adjusted P values for multiple comparison; such results, while they may considered nonsignificant, are still hypothesis-generating by nature and warrant consideration and discussion. Findings from the present study confirm the previously reported success of CACFP in promoting a higher quality of foods served to young children,[11,12] especially for CACFP-required standards for foods and beverages served. However, CACFP-participating programs did not report a significantly higher implementation of CACFP best practices than non-CACFP programs. This finding is not particularly surprising because food and beverages served are included in CACFP requirements, while specific best practices on foods and staff behaviors are not.[25] This is important because implementation of best practices such as child praising, involvement, and promotion of autonomy during mealtime increases the likelihood of children accepting the nutritious foods they are served.[26] To promote beneficial staff behaviors encouraging children's consumption of healthful food items, it may be necessary to include related expectations and education in state quality rating systems or licensure and/or CACFP

requirements. This information may be particularly important for practices with lower adherence overall, such as eating the same foods as the children and serving meals family-style.

In the present sample, those participating in CACFP across both ECE contexts (center and home-based) reported lower perceived difficulty implementing best practices for serving foods and beverages and lower concern for food costs. Consistent with these findings, program directors of facilities who receive reimbursement from CACFP are less likely to report cost-related concerns as a significant barrier to providing quality foods to children.[27] The amount of CACFP subsidization has previously been related to the nutritional quality of home-based ECE menus.[12] However, other studies report the presence of cost-related barriers to serving healthy foods for CACFP-participating child care directors.[27] Given these mixed findings, future studies should explore context-specific strategies (e.g., level of subsidization, leveraging additional resources and programs, such as farm to ECE, and food procurement and purchasing[28]) to alleviate the cost-related burden of healthy foods.

The present findings show that CACFP participation was also related to a higher frequency of receiving professional nutrition education. Studies have previously shown that meals served are more healthful when the staff is required to complete continued education on CACFP compliance. [11,12] Trainings reported in the present study included in-person or online CACFP-required training but excluded training specifically on food safety or food program guidelines. However, CACFP-led nutrition training may primarily focus on instruction of reimbursement-qualifying practices vs benefit of practices to improve diet quality. For CACFP certification and renewal, ECE providers are required to attend annual nutrition training held by the Nebraska (or State) Department of Education, although required annual hours are not specified.[29] A change in language and focus could potentially be considered to promote better recommended best practices and healthful mealtime behaviors.

There is a paucity of research in home-based ECEs overall compared with centers; the present results indicated that home-based ECE providers participating in CACFP were more likely to report a lack of support from other providers as a barrier to implementing best practices, although these results were no longer significant after

adjusting for multiple comparison. As reported by the current study sample, compared with centers, home-based ECEs typically have fewer providers on staff and are more likely to have food prepared on-site, with the provider bearing responsibility for meal planning and preparation. Perceived support is a common teacher-reported barrier to promoting health for young children,[30,31] and can predict successful practice implementation for caregivers of young children.[30] Differing barriers to nutrition practice implementation in home-based ECEs may be attributed to additional time, scheduling, budgetary, and organizational constraints incurred from providers' multiple responsibilities, which can be intensified by lack of additional staff.[32,33] These findings, in combination with previously known differences between ECE contexts, may indicate a need for additional support for home-based ECE providers, potentially through their program sponsors or specialized CACFP reimbursement.

The design of the current study is subject to limitations. Because of the cross-sectional nature of the study, causality cannot be inferred from the reported differences in proportions. Data were self-reported and could be subject to selection bias, response bias, and social desirability. This finding may be particularly important among those participating in CACFP with assumed knowledge of standards and best practices and perception of survey response being assessed for compliance. Overestimation of perceived vs actual mealtime practices (enthusiastic role modeling, family-style meal service, etc.) has been previously identified in ECE providers, potentially because of a lack of understanding of what constitutes each practice.[34] Finally, responses were primarily recorded from program directors, who, on the basis of various levels of experience in classrooms, may not have complete knowledge of current classroom activities or provider barriers. This limitation may be more pertinent in centers than homebased ECEs, as home-based directors typically serve in all roles simultaneously. However, respondents were instructed to defer to the staff with the most accurate insight on that practice. Strengths of the study included the use of a large statewide sample representing both centers and home-based ECEs and the use of quantitative data derived from previous intensive qualitative work. Analyses were adjusted for multiple comparisons to control for type I error. The study objective is novel, representing a unique landscape and region of the US, and provides

valuable insight to inform future policy development and evaluation. Furthermore, this study provides baseline data collected previous to recent changes in CACFP standards to compare future studies conducted after implementation.

Implications for research and practice

These findings can help to inform intervention and resources provided by statewide and community influencers and practitioners, particularly suggesting incentivizing training for those mealtime practices that have a lower prevalence of implementation. Although professional development groups such as the Nebraska Department of Education–Team Nutrition organization offer training specific to mealtime best practices,[30] providers' motivation to attend is heavily driven by CACFP and state licensure requirements.[35] Thus, these data suggest strengthening these requirements to include mealtime behaviors and potentially altering reimbursement rates and resources to assist ECEs in overcoming common context- specific barriers to implementation. Furthermore, improving CACFP enrollment through sponsored outreach programs, or strengthening state licensing to accommodate CACFP requirements and best practices, could be potential key strategies for improving nutrition-related practices in non-CACFP settings. On the basis of these findings, future research could examine (1) mixed-methods understanding of feasibility for strategies promoting mealtime best practices across ECE contexts (centers vs home-based), especially for practices least implemented; (2) influence of training and subsidization on perceptions of support for meeting nutrition practices; and (3) ECE implementation of CACFP requirements and best practices, including difficulty and barriers, after the 2017 updates to CACFP standards. Moving forward, it will be important that intervention consider context-specific barriers to promoting health for young children and provide resources to fit these needs.

Disclosure The authors have not stated any conflicts of interest.

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Tables 1–6 follow.

Table 1. Child Care Center Characteristics, by Child Care Context and CACFP Participation (N = 1,345)

Child Care Center Characteristics	*Center-Based Care (n = 292)*		*Family Child Care Home (n = 1,053)*	
	CACFP (n = 198)	*Non-CACFP (n = 94)*	*CACFP (n = 970)*	*Non-CACFP (n = 83)*
Average no. of children in the program (mean ± SD)				
0–23 months	15.6 ± 10.8	15.5 ± 14.7	2.3 ± 1.2	2.0 ± 0.9
24–35 months	13.0 ± 9.3	15.3 ± 13.8	2.3 ± 1.4	2.2 ± 1.1
3–5 years	26.0 ± 17.8	32.7 ± 22.5	3.3 ± 1.8	3.4 ± 1.6
Older than 5 years	18.2 ± 20.4	14.6 ± 18.9	2.3 ± 1.8	2.4 ± 2.1
Average no. of children per racial background (mean ± SD)				
American Indian or Alaskan Native	2.3 ± 7.6	0.9 ± 2.4	0.3 ± 1.0	0.2 ± 0.8
Asian	1.7 ± 2.5	2.2 ± 2.8	0.1 §0.5	0.0 ± 0.0
Black or African American	7.6 ± 14.1	3.2 ± 5.3	0.9 ± 2.0	1.1 ± 3.1
Native Hawaiian or Pacific Islander	0.4 ± 1.0	0.3 ± 1.5	0.1 ± 0.6	0.0 ± 0.2
White	50.3 ± 38.4	59.7 ± 40.1	7.7 ± 3.3	7.6 ± 3.1
Mixed Race	7.5 ± 8.2	5.0 ± 7.5	1.1 ± 1.6	0.8 ± 1.2
Other	4.0 ± 7.9	11.2 ± 38.2	0.2 ± 1.3	0.6 ± 2.2
Average no. of providers (mean ± SD)	16.1 ± 11.6	17.0 ± 13.6	1.3 ± 1.2	1.3 ± 0.7
Program schedule (%)				
Half-day	0.5	3.2	0.1	0.0
Full-day	69.7	59.6	78.1	62.7
Both half-day and full-day	24.7	29.8	18.0	34.9
Other	1.5	3.2	1.8	0.0
Food prepared on-site (%)				
Yes	72.2	56.4	98.6	95.2
No	14.1	29.8	0.5	0.0
Both yes and no	13.6	11.7	0.9	4.8
Responsible for menu planning (%)[a]				
Owner of child care program	27.8	31.9	63.1	54.2
Director or site supervisor/manager	44.4	48.9	3.6	4.8
Family child care provider	1.0	0.0	46.5	59.0
Cook or chef	42.4	29.8	1.0	1.2
Catering company	15.7	16.0	0.2	0.0
Dietitian	4.5	3.2	0.2	0.0
Parent/guardians provide food for their children	1.0	9.6	0.1	3.6
Go NAP SACC participation (% yes)	39.4	23.4	11.0	12.0
Nebraska Step Up to Quality participation (% yes)	38.9	19.1	8.8	9.6
NAEYC member (% yes)	15.2	13.8	5.7	6.0

CACFP indicates Child and Adult Care Food Program; Go NAP SACC, Nutrition and Physical Activity Self-Assessment in Child Care; NAEYC, National Association for the Education of Young Children

a. Director/provider was given the response option to select all that apply.

Table 2. Providers' Implementation Requirements and Best Practices for Serving Foods and Beverages and Level of Difficulty, by CACFP Participation and Child Care Context (N = 1,345)

	Center-Based Care (n = 292)								*Family Child care Home (n = 1,053)*							
	Implementation of Practices [a]				*Level of Difficulty* [b]				*Implementation of Practices* [a]				*Level of Difficulty* [b]			
Serving Foods and Beverages	*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*		
	n (%)	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*
Requirements																
Serve fruit, 1+ time/d	197 (99.5)	86 (91.5)	13.675	<0.001	182 (96.3)	76 (89.4)	5.054	0.03	968 (99.9)	82 (98.8)	4.889	0.03	904 (96.9)	70 (86.4)	21.570	<0.001
Serve vegetables 1+ time/d	197 (99.5)	82 (88.2)	20.520	<0.001	177 (93.7)	72 (85.7)	4.568	0.03	962 (99.5)	80 (96.4)	9.699	0.002	892 (95.8)	65 (84.4)	19.225	<0.001
Serve skim or 1% milk	191 (97)	68 (74.7)	33.966	<0.001	182 (96.8)	72 (90)	5.254	0.02	954 (99.2)	59 (72)	194.269	<0.001	903 (97.1)	57 (79.2)	53.497	<0.001
Serve only unflavored skim or 1% milk	175 (89.7)	57 (61.3)	32.546	<0.001	179 (96.8)	70 (88.6)	6.860	0.009	890 (93.3)	51 (63)	83.168	<0.001	862 (94.8)	56 (78.9)	28.293	<0.001
Serve whole grain, 1+ time/d	176 (88.9)	73 (78.5)	5.536	0.02	130 (69.9)	57 (68.7)	0.040	0.84	830 (85.8)	65 (80.2)	1.870	0.17	669 (72.3)	52 (71.2)	0.040	0.84
Best practices																
Prepare cooked vegetables without fat or butter	185 (96.4)	75 (83.3)	14.444	<0.001	164 (87.7)	68 (87.2)	0.014	0.91	915 (94.6)	76 (91.6)	1.346	0.25	838 (90.5)	58 (76.3)	14.931	<0.001
Serve only lean or low-fat meat	159 (81.1)	65 (69.9)	4.563	0.03	122 (66.3)	59 (72.8)	1.109	0.29	760 (78.9)	64 (77.1)	0.150	0.70	568 (60.8)	45 (58.4)	0.168	0.68
Serve fried meats 1+ time/ wk	141 (71.9)	64 (71.1)	0.021	0.89	146 (77.7)	65 (79.3)	0.087	0.77	764 (79)	63 (77.8)	0.068	0.79	660 (71.6)	52 (66.7)	0.848	0.36
Serve high sugar/fat food <1 time/wk	147 (74.6)	65 (69.1)	0.963	0.33	134 (70.9)	54 (65.1)	0.921	0.34	664 (69)	52 (64.2)	0.784	0.38	592 (64.3)	48 (64)	0.004	0.95
Never serve sugary drinks	156 (78.8)	68 (72.3)	1.483	0.22	160 (87.9)	72 (88.9)	0.051	0.82	768 (79.9)	57 (70.4)	4.129	0.04	817 (89.5)	61 (83.6)	2.432	0.12
Use either health foods or nonfood treats	125 (64.1)	53 (56.4)	1.598	0.21	87 (46.5)	40 (50.6)	0.376	0.54	517 (54.1)	47 (59.5)	0.863	0.35	458 (50.7)	38 (52.8)	0.119	0.73

CACFP indicates Child and Adult Care Food Program.

a. Percentage of providers who responded yes.

b. Percentage of providers who responded not at all difficult.

Note: Chi-square test of independence using 2 × 2 contingency table, adjusted for multiple comparison (P < 0.004).

Table 3. Barriers to Implementing Requirements and Best Practices for Serving Foods and Beverages, by CACFP Participation and Child Care Context (N = 1,345)

Barriers to Providing Healthier Meals and Snacks	*Center-Based Care (n = 292)*				*Family Child Care Home (n = 1,053)*			
	CACFP n (%)	*Non-CACFP n (%)*	χ^2	*P*	*CACFP n (%)*	*Non-CACFP n (%)*	χ^2	*P*
Limited space for food storage	139 (70.2)	61 (66.3)	0.446	0.50	820 (85.6)	73 (90.1)	1.268	0.26
Limited time to shop	131 (66.8)	56 (61.5)	0.768	0.38	587 (61.7)	57 (70.4)	2.378	0.12
Not enough money to cover the cost	128 (65)	55 (60.4)	0.553	0.46	524 (55.2)	58 (70.7)	7.445	0.006
Children would not like the taste of healthy foods	136 (69.7)	64 (69.6)	0.001	0.98	577 (61.3)	54 (65.9)	0.657	0.42
Lack of control over the delivered foods	150 (76.1)	70 (77.8)	0.092	0.76	896 (95.5)	78 (98.7)	1.856	0.17
Lack of the time to prepare foods	156 (79.6)	80 (87.9)	2.944	0.09	720 (76.3)	64 (81)	0.915	0.34
Other areas have higher priority than nutrition	174 (88.3)	86 (95.6)	3.790	0.05	883 (93.5)	75 (93.8)	0.005	0.94
Many different recommendations to follow	168 (84.8)	80 (87.9)	0.481	0.49	753 (79.4)	68 (82.9)	0.570	0.45
Parents do not support healthy foods	177 (90.3)	84 (92.3)	0.302	0.58	837 (88.7)	73 (91.3)	0.498	0.48
Lack of the knowledge to prepare foods	180 (90.9)	85 (93.4)	0.511	0.48	902 (95.3)	76 (95)	0.020	0.89
Lack of support from other providers	181 (92.3)	89 (97.8)	3.319	0.07	915 (96.2)	73 (91.3)	4.550	0.03
Unsure which foods can be reimbursed	184 (93.9)	81 (95.3)	0.222	0.64	854 (89.8)	73 (93.6)	1.159	0.28
Lack of availability of health foods	178 (89.9)	84 (92.3)	0.427	0.51	834 (87.3)	74 (90.2)	0.589	0.44

CACFP indicates Child and Adult Care Food Program.

Note: Chi-square test of independence using 2 × 2 contingency table, adjusted for multiple comparison ($P < 0.004$); data represent percentage of providers who responded no.

Table 4. Providers' Implementation Best Practices for Mealtime Behaviors and Level of Difficulty, by CACFP Participation and Child Care Context (N = 1,345)

	Center-Based Care (n = 292)								*Family Child care Home (n = 1,053)*							
	Implementation of Practices [a]				*Level of Difficulty* [b]				*Implementation of Practices* [a]				*Level of Difficulty* [b]			
Mealtime Practices	*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*			*CACFP*	*Non-CACFP*		
	n (%)	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*
Praise children for trying new foods	196 (99)	92 (100)	0.936	0.33	181 (93.8)	78 (94)	0.004	0.95	957 (99.4)	81 (100)	0.508	0.48	874 (95.9)	74 (96.1)	0.005	0.94
Talk about health foods	188 (95.4)	89 (96.7)	0.269	0.60	170 (88.5)	77 (92.8)	1.133	0.29	922 (96.2)	76 (92.7)	2.469	0.12	829 (90.9)	74 (93.7)	0.690	0.41
Allow children to decide when they are full	188 (95.4)	88 (95.7)	0.007	0.93	164 (89.1)	75 (92.6)	0.762	0.38	881 (92.6)	72 (88.9)	1.485	0.22	796 (89.1)	60 (84.5)	1.418	0.23
Sit with children during meals and snacks	176 (89.8)	77 (84.6)	1.597	0.21	130 (70.7)	63 (77.8)	1.443	0.23	746 (79.2)	62 (78.5)	0.022	0.88	548 (60.1)	53 (67.1)	1.493	0.22
Role model eating healthy foods	178 (91.3)	84 (91.3)	< 0.001	0.99	139 (77.7)	74 (89.2)	4.935	0.03	859 (90.7)	66 (82.5)	5.555	0.02	795 (88.1)	61 (84.7)	0.730	0.39
Ask them if they are full before removing plates	167 (85.2)	85 (93.4)	3.905	0.05	170 (92.9)	77 (95.1)	0.437	0.51	880 (91.9)	78 (96.3)	2.047	0.15	836 (94)	67 (94.4)	0.013	0.91
Children help with setting and clearing	146 (74.9)	66 (74.2)	0.016	0.90	113 (65.3)	60 (74.1)	1.947	0.16	652 (69.1)	53 (65.4)	0.478	0.49	553 (61.6)	50 (68.5)	1.344	0.25
Not use food to calm upset children	136 (69.7)	68 (73.9)	0.529	0.47	160 (87.4)	72 (90)	0.353	0.55	648 (68)	52 (65.8)	0.158	0.69	843 (94.8)	67 (95.7)	0.106	0.75
Not use preferred foods to encourage less preferred foods	50 (25.9)	27 (30)	0.519	0.47	151 (86.8)	66 (84.6)	0.211	0.65	282 (29.9)	29 (36.7)	1.610	0.20	767 (88.2)	58 (84.1)	1.009	0.32
Eat together with children	132 (68.4)	53 (58.9)	2.450	0.12	116 (64.8)	51 (63.8)	0.027	0.87	565 (61.1)	44 (55.7)	0.907	0.34	464 (51.8)	41 (56.2)	0.519	0.47
Ask them if they are hungry before serving more	116 (59.2)	56 (62.9)	0.357	0.55	154 (86.5)	68 (86.1)	0.009	0.92	607 (63.6)	60 (73.2)	3.039	0.08	812 (92.3)	63 (86.3)	3.198	0.07
Not praise children for finishing food or cleaning	87 (46)	42 (47.2)	0.033	0.86	129 (74.6)	63 (80.8)	1.150	0.28	361 (38.6)	31 (40.8)	0.141	0.71	686 (80.6)	62 (88.6)	2.687	0.10
Eat only what are being served to children	94 (48.5)	41 (45.6)	0.207	0.65	97 (54.2)	47 (56)	0.072	0.79	491 (52.5)	35 (44.3)	1.940	0.16	556 (62.8)	45 (62.5)	0.003	0.96
Meals and snacks are served family-style	76 (39.6)	31 (35.2)	0.485	0.49	78 (45.6)	41 (50.6)	0.552	0.46	208 (22.2)	6 (7.6)	9.368	0.002	345 (39)	22 (32.4)	1.187	0.27

CACFP indicates Child and Adult Care Food Program.

a. Percentage of providers who responded yes.

b. Percentage of providers who responded not at all difficult.

Note: Chi-square analysis using 2 × 2 contingency table; adjusted for multiple comparison (P < 0.004).

Table 5. Barriers to Implementing Best Practices for Mealtime Behaviors, by CACFP Participation and Child Care Context (N = 1,345)

Barriers to Implementing Mealtime Practices	*Center-Based Care (n = 292)*				*Family Child Care Home (n = 1,053)*			
	CACFP n (%)	*Non-CACFP n (%)*	χ^2	*P*	*CACFP n (%)*	*Non-CACFP n (%)*	χ^2	*P*
Not enough money to cover the cost	149 (75.6)	61 (70.1)	0.954	0.33	818 (86.8)	73 (92.4)	2.034	0.15
Mealtimes with children are stressful	151 (77.8)	81 (90)	6.083	0.01	822 (87.4)	72 (88.9)	0.160	0.69
Dietary restrictions	161 (81.7)	66 (73.3)	2.631	0.11	798 (83.7)	62 (75.6)	3.548	0.06
Providers do not have time to sit with children	158 (80.6)	72 (80)	0.015	0.90	583 (62.2)	54 (68.4)	1.197	0.27
Providers do not like the taste of healthy foods	172 (87.8)	80 (87.9)	0.001	0.97	915 (95.6)	77 (93.9)	0.511	0.48
Not enough providers to sit with children	174 (87.9)	84 (93.3)	1.973	0.16	688 (73)	59 (75.6)	0.264	0.61
Uncertain how to encourage new foods	180 (91.4)	80 (89.9)	0.163	0.69	883 (92.3)	73 (89)	1.081	0.30
Unsure how to encourage children	184 (92.9)	85 (94.4)	0.231	0.63	904 (94.8)	76 (95)	0.009	0.93

CACFP indicates Child and Adult Care Food Program.

Note: Chi-square test of independence using 2 × 2 contingency table, adjusted for multiple comparison ($P < 0.006$); data represent the percentage of providers who responded no.

Table 6. Providers' Implementation of Best Practices on Nutrition Education, by CACFP Participation and Child Care Context (N = 1,345)

Nutrition Education Practices	*Center-Based Care (n = 292)*				*Family Child Care Home (n = 1,053)*			
	CACFP	*Non-CACFP*			*CACFP*	*Non-CACFP*		
	n (%)	*n (%)*	χ^2	*P*	*n (%)*	*n (%)*	χ^2	*P*
Talk with children informally about healthy eating during mealtime[a]	171 (86.8)	81 (88)	0.087	0.73	823 (86.8)	71 (88.8)	0.244	0.62
Providers receive professional development on child nutrition[b]	156 (79.2)	57 (62.6)	8.853	0.003	770 (81.1)	49 (62.8)	14.973	< 0.001
Children are involved in handson sensory food experiences[a]	129 (65.5)	62 (67.4)	0.102	0.75	707 (74.3)	54 (66.7)	2.222	0.14
Structured nutrition education is incorporated into daily routines[a]	108 (55.1)	43 (46.7)	1.756	0.19	456 (48.3)	36 (45.6)	0.210	0.65

CACFP indicates Child and Adult Care Food Program.

a. Percentage of providers who engage in the practice more than once per month.

b. Percentage of providers who engage in the practice once or more per year.

Note: Chi-square test of independence using 2 × 2 contingency table, adjusted for multiple comparison (P < 0.012)