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RESEARCH ARTICLE

Foodservice Directors' Perceived Barriers to Student Participation in School Meals When Meals Were Served Free of Charge During the 2021–2022 School Year

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ABSTRACT

Background: School meals were served free of charge to all public school students in the United States during the COVID-19 pandemic, but some students still did not participate.

Methods: In this mixed-methods study, surveys and interviews were conducted with food service directors (FSDs) from California ($n = 556$ surveys; $n = 29$ interviews) and Maine ($n = 43$ surveys; $n = 20$ interviews) during spring 2022. Survey data was analyzed using multivariable logistic regression models, and interview data was analyzed using the immersion/crystallization approach.

Results: Students' preference to eat meals from home or elsewhere (81.5%) and negative perceptions of the school food's taste (67%) were the most common barriers reported. Schools' prior community eligibility provision (CEP) participation and smaller student enrollment were associated with fewer reported barriers. Inadequate time to eat lunch and stigma were also reported as barriers to participation.

Implications for School Health Policy, Practice, and Equity: Investments are needed to help schools partner with students to optimize school meal experiences and to improve food taste. Policies that provide school meals free of charge for all students can also help reduce negative social barriers such as stigma.

Conclusions: Despite the provision of USM, barriers to participation remain. Policies to enhance meal quality and program implementation are needed.

1 | Background

School meals provide daily nutrition to students and improve food security for households with low income within the United States (US) [1]. On average, school meals are the healthiest source of food for US students [2–4]. Increasing students' participation in school meals benefits their nutrition and health [3, 4]. However, despite these benefits, many students do not participate in school meals and therefore miss out on potential nutrition and other positive health and academic outcomes.

Providing school meals to all students increases student participation in school meals [5]. The community eligibility provision (CEP) as well as Provisions 2 or 3 have been successful at improving school meal participation [6–11]. Most recently, during the COVID-19 pandemic, the US Department of Agriculture implemented "waivers" that allowed school meals to be offered to all students without charge in part to ensure healthy meals were readily available to children and to address rising food insecurity [12–16]. During this time, school meal participation increased as well [15]. These waivers ended in the 2022–2023 school year (SY) and schools reverted to a tiered system of free or reduced-price meals (FRPM) based on household income. In response, multiple states passed legislation to establish a universal school meal policy at the state level. California and Maine were the first two states to adopt permanent policies providing school meals for all students during the 2022–2023 SY [17–19].

As more states begin to adopt universal school meal (USM) policies, research is needed to understand the barriers to school meal participation in the context of meals being served free of charge to all students. Foodservice directors (FSDs) are key stakeholders in school meals given that they understand the barriers to school meal participation, as they oversee all aspects of a school district's nutrition program [20]. These include ensuring school meals are nutritionally balanced and meet federal school meal regulations, and managing school meal menus and meal quality among other duties [20]. This study aims to examine FSDs perceptions of the barriers to students' school meal participation during the 2021–2022 SY in California and Maine, while federal funding supported meals free of charge for all students in the US.

2 | Methods

2.1 | Participants

In the spring of 2022, the California Department of Education (CDE) sent an email to all FSDs representing school food authorities in California ($n = 1116$) with a link to participate in a survey on their perceptions of, and experiences with, USM during the 2021–2022 SY. Two follow-up emails were sent to increase the response rate. The survey link was open for 4 weeks and, as per state rules, no incentives were provided for participation. Concurrently, in Maine, Full Plates Full Potential, a local anti-hunger organization, sent an email with a survey link to all FSDs ($n = 121$). Follow-up reminder emails were sent 2 weeks after the initial dissemination of the survey. The link was open for 4 weeks and FSDs were provided a $25 (USD) incentive for their participation.

At the end of the survey, FSDs in both states were asked for their interest in participating in a follow-up interview to expand on their responses. A subsample of FSDs was purposively selected among those who agreed to be interviewed to ensure variability by urbanicity, district enrollment size (total number of students within the school district), and percent of students eligible for free or reduced-price meals. Galloway Research, an independent research firm, contacted selected participants to schedule and conduct the interviews.

2.2 | Instrumentation

2.2.1 | Quantitative Survey

The survey was developed by a national team of researchers in collaboration with the CDE and nutrition and school policy advocacy organizations. Survey questions were piloted with FSDs and cafeteria managers and updated based on their feedback. The final survey included questions related to multiple aspects of school meal operations during the 2021–2022 SY, including FSDs' perceived barriers to student participation. The final 55-question survey was identical for both states, except for three additional questions in Maine exploring state-specific aspects of school food service operations [21]. The current analysis focused on one question about 14 perceived barriers to student participation in school meals, including students' or parents' perceptions of school meals, students' preferences (e.g., timing and location) of meals eaten at school, and social barriers related to school meal participation, among others. The surveys took FSDs approximately 45 min to complete and were programmed and administered using Qualtrics (Version March 2022, Provo, UT, USA) [22]. Additional study details have been previously published [23, 24].

2.2.2 | Qualitative Interviews

Qualitative data were collected to contextualize the quantitative survey data. A semi-structured interview guide was developed by the research team along with the CDE and nutrition and school policy advocacy and anti-hunger groups. The interview questions were pilot tested with food service directors and cafeteria managers in California and Maine. The interviews focused on some of the most important topics of the survey, including the perceived barriers to student participation. The final interview guide consisted of 16 open-ended questions with follow-up questions to probe for clarifications and additional information. The interviews were conducted via Zoom in California ($n = 29$) and Maine ($n = 20$). Each interview lasted approximately 45 min and was audio recorded and transcribed verbatim by trained research assistants. The lead researcher checked each transcript for accuracy. FSDs in both states received $25 (USD) as an incentive.

2.3 | Procedures

2.3.1 | Dependent Variable

In the survey, FSDs reported their perceived prevalence of the 14 barriers using a 4-point scale: "none or very few students," "some

students," "many or most students," and "don't know/not sure." For analysis, responses were dichotomized as "some, many, or most students" versus "none or very few students"; "don't know/not sure" responses were omitted.

2.3.2 | Covariates

Student enrollment size was collected from the respective state departments of education [25, 26]. School districts with student enrollment values that were considered potentially unreliable (i.e., school food authorities with < 50 students), as well as juvenile detention centers, alternative schools, and schools for special education were excluded. District enrollment size was evenly distributed into categories as follows: low enrollment (< 1000 students); moderate (1000–4499 students); and high (4500+ students). Urbanicity was classified using the USDA's 2010 Rural–Urban Commuting Area (RUCA) codes categorizing census tracts based on population density, urbanization, and commuting patterns [27]. School food authorities were classified into four groups: urban (RUCA code 1); suburban (RUCA codes 2–3); large town rural (RUCA codes 4–6); and small town rural (RUCA codes 7–10). Additionally, based on data from the state departments of education, the results were stratified by prior CEP status during the 2019–2020 SY (schools providing USM through CEP or schools not providing USM).

2.4 | Data Analysis

In California, $n = 556$ FSDs participated in the survey (representing approximately 50% of the School Food Authorities [SFAs] in the state) and in Maine, $n = 36$ FSDs participated in the survey (representing approximately 36% of the SFAs in the state) yielding 599 surveys across the two states. Descriptive statistics were used to examine FSDs' demographic characteristics in California and Maine. Multivariable logistic regression models were used to examine whether FSDs' perceptions of student barriers to school meal participation varied by urbanicity, district enrollment size, and prior CEP status. To account for nesting by state, the logistic regression model included state as a fixed effect variable in the model. Given that the regression analyses were conducted for 14 barriers as dependent variables, Bonferroni correction was used to account for multiple comparisons (Bonferroni $\alpha = 0.007$). Analyses were conducted using SPSS (Version 29.0, IBM Corp. Armonk, NY, USA) [28].

The qualitative analysis relied on an immersion-crystallization methodology, an inductive and iterative process to identify emergent themes and patterns in the qualitative data regarding perceived barriers to student participation [29]. The lead author reviewed and coded the transcripts and developed a codebook designed to capture the ideas that emerged from the data as being frequently discussed or important to note. From the coded transcripts, themes were extracted and organized under overarching domains. Analyses of the qualitative data were conducted using Microsoft Excel (2023; Version 16.72) [30].

3 | Results

3.1 | Quantitative Surveys

Table 1 describes the survey participants' characteristics. In both states, most FSDs had approximately 1–9 years of experience in their current positions (63% in California and 60% in Maine) and attended some college or had a bachelor's or master's degree. Before COVID-19, most of the FSDs' (64% in California and 83% in Maine) worked in non-CEP districts. In California, two-thirds of the FSDs' districts were in urban areas (66%) whereas over half

TABLE 1 | Demographic characteristics of participating Foodservice Directors in California ($n = 556$) and Maine ($n = 43$) based on survey data collected during the 2021–2022 school year on universal school meals.

	n (%)	
Respondent characteristics	**California**	**Maine**
Role		
School Nutrition Director/Foodservice Director	379 (68%)	31 (72%)
School Nutrition Supervisor/Manager	95 (17%)	6 (14%)
Other	82 (15%)	6 (14%)
Years worked in role		
< 1 year	81 (15%)	1 (2%)
1–9 years	352 (63%)	26 (60%)
10–19 years	102 (18%)	10 (23%)
20+ years	25 (4%)	6 (14%)
Highest year of schooling completed		
Some high school or high school/GED	58 (10%)	9 (21%)
Some college and/or Associate's degree	201 (36%)	18 (42%)
Bachelor's degree	201 (36%)	13 (30%)
Master's degree or higher	92 (17%)	3 (7%)
Urbanicity[a]		
Urban	365 (66%)	7 (16%)
Suburban	62 (11%)	6 (14%)
Large town rural	67 (12%)	7 (16%)
Small town rural	62 (11%)	23 (53%)
CEP status prior to COVID-19		
CEP or Provision 2 or 3	195 (36%)	7 (17%)
Non-CEP or Provision 2 or 3	351 (64%)	34 (83%)

Abbreviations: CEP = community eligibility provision; GED = general educational development test.

[a]Based on Rural–Urban Commuting Areas (RUCA) codes from the US Department of Agriculture's Economic Research Service.

of the FSDs' districts in Maine were located in small towns or rural areas (53%).

The perceived barriers to student school meal participation reported by FSDs in California and Maine are highlighted in Figure 1. The figure includes barriers where > 50% of FSDs in both states reported them as a barrier for at least some students. The majority perceived that some or many students in their districts prefer to eat meals from home or elsewhere (75% in California and 88% in Maine). Additionally, about 65% of FSDs in both states perceived that some or many students in their districts do not like the taste of school food and that they often do not eat breakfast or lunch. Regarding social influence, around half of FSDs in both states perceived that students do not eat school meals because their friends do not eat them (56% of FSDs in California and 53% in Maine).

Table 2 compares perceived barriers to school meal participation reported by Foodservice Directors in California and Maine by CEP status. Compared with FSDs from CEP districts, FSDs from non-CEP districts were more likely to report: (1) students or parents do not think the food is healthy (OR = 2.01, $p < 0.001$); (2) students prefer to eat meals from home or elsewhere (OR = 2.54, $p < 0.001$); (3) students or parents do not understand that meals are free (OR = 2.03, $p = 0.001$); and (4) students or parents think only needy kids eat school breakfast and they do not want to be thought of that way (OR = 2.84, $p < 0.001$) as barriers to school meal participation for at least some students.

FSDs' perceived barriers to school meal participation also varied by district enrollment size (Table 3). Compared with districts with high enrollment, FSDs from districts with low and moderate enrollment were less likely to report: (1) students or parents do not think the food is healthy (OR = 0.34, $p < 0.001$); (2) students are unable to get to school on time for breakfast (OR = 0.39, $p < 0.001$); and (3) students do not have enough time to get and eat the lunch (OR = 0.41, $p < 0.001$) as barriers to school meal participation for at least some students. For all perceived barriers except for "school meals do not meet students' cultural or non-medical dietary preferences," and "students prefer to eat meals from home or elsewhere," FSDs from districts with the lowest level of student enrollment had statistically significant lower odds of reporting each barrier compared to FSDs from districts with the highest level of student enrollment. Results for urbanicity are provided as Table S1. There was no variation by urbanicity for any of the perceived barriers.

3.2 | Qualitative Interviews

Three domains emerged from the barriers to school meal participation perceived by FSDs in California and Maine: (1) social barriers, (2) preferences for location and time-related barriers, and (3) food barriers. Table 4 provides the domains, themes, and relevant quotations demonstrating barriers perceived by FSDs in California and Maine.

3.2.1 | Domain 1: Barriers Related to the Social Dynamics of School Meals

Three themes related to FSDs' perceptions emerged in both states. They were: (1) peer-pressure and cafeteria anxiety; (2) school meal stigma; and (3) grade-level and gender dependent. These themes emphasize the role that peers play in school meal participation.

In both states, FSDs perceived students participated in school meals if their friends did, and avoided participation if their friends did not. In addition, FSDs perceived students felt uncomfortable and "anxious" in the cafeteria for a variety of reasons. For example, middle and high school students may feel the cafeteria is too "crowded" or may feel self-conscious when eating in front

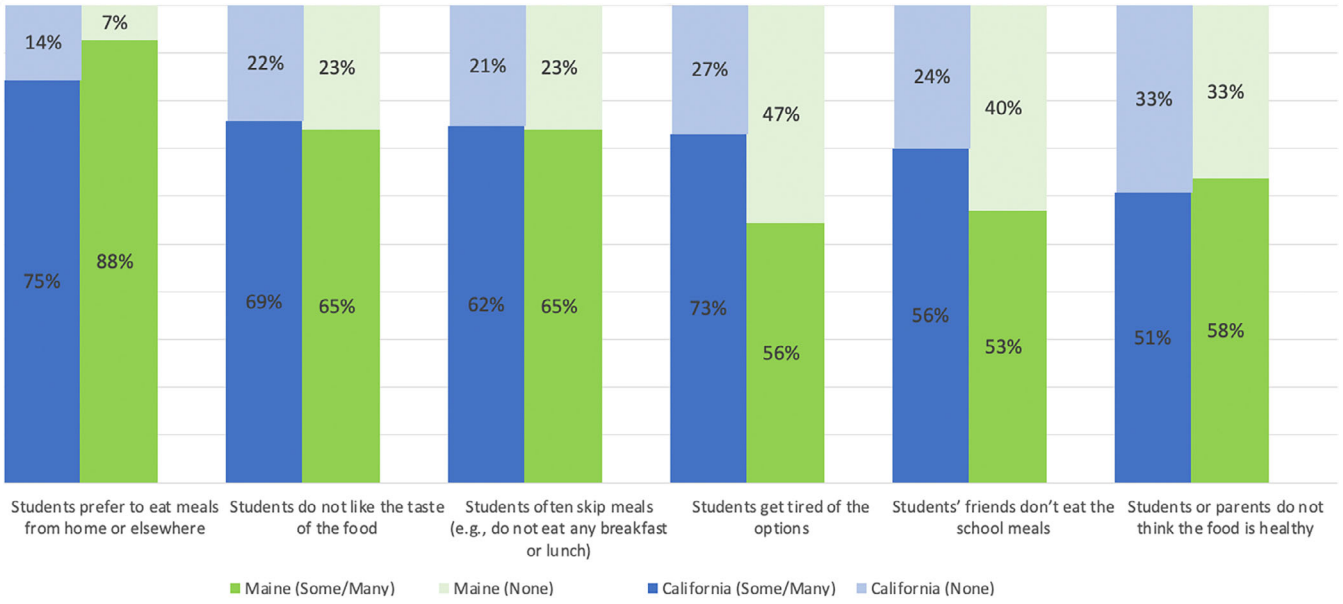

FIGURE 1 | Perceived barriers to student school meal participation reported by Foodservice Directors in California and Maine during the 2021–2022 school year.

TABLE 2 | Perceived barriers to school meal participation by prior CEP[a] status reported by Foodservice Directors from California and Maine during the 2021–22 school year.

Barrier to school meal participation[b]	OR	95% CI	*p*
Students do not like the taste of the food	1.39	0.91, 2.11	0.12
Students do not think the food is fresh	1.27	0.85, 1.89	0.24
Students or parents do not think the food is healthy	2.01*	1.34, 3.02	< 0.001
Students prefer to eat a la carte options	1.34	0.88, 2.06	0.18
Students get tired of the options	1.34	0.88, 2.04	0.17
Do not meet students' cultural or non-medical dietary preferences	1.31	0.86, 2.00	0.20
Portions are not big enough/not enough food provided	1.20	0.82, 1.76	0.34
Students prefer to eat meals from home or elsewhere	2.54*	1.56, 4.15	< 0.001
Students often skip meals (e.g., do not eat any breakfast or lunch)	1.38	0.90, 2.10	0.14
Students unable to get to school on time for breakfast	1.39	0.94, 2.07	0.10
Students don't have enough time to get and eat the lunch	1.14	0.76, 1.71	0.51
Students or parents don't understand that meals are free	2.03*	1.32, 3.11	0.001
Students or parents think only needy kids eat school breakfast and don't want to be thought of that way	2.84*	1.88, 4.27	< 0.001
Students' friends don't eat the school meals	1.73	1.14, 2.63	0.01

Abbreviations: CEP = community eligibility provision; CI = confidence interval; FSD = foodservice director; OR = odds ratio.

*Statistical significance at the Bonferroni adjusted $p < 0.007$ level.

[a]Reference group is CEP status before COVID-19 is defined as 0 = "CEP or Provision 2 or 3," 1 = "Non-CEP or Provision 2 or 3."

[b]Perceived barriers to student participation were compared with mixed effects logistic regression models adjusted for urbanicity and enrollment size, with state as a fixed effect ($n = 599$). Outcome: perceived barrier for 0 = "None or very few students," 1 = "Some, many, or most students".

of others. FSDs perceived this discomfort may be a reason for lack of student participation.

FSDs believed some students held perceptions that the program is for students from households with low income. Despite meals being free for all, FSDs also perceived that stigma associated with school meal participation caused some students to feel self-conscious and worried about peer perceptions. Specifically, in California, FSDs mentioned middle school as an age when students do not want to be seen eating school meals in front of others and they believed this lack of participation stemmed from students' wishing to avoid being viewed as "poor" by fellow students.

Generally, in both states, it was noted that high school students participated less than students in lower grades. In addition, FSDs believed older students (i.e., middle and high school students) preferred to socialize. In districts or schools with open-campus policies, where students can leave for lunch, FSDs described students eating off-campus with friends, rather than waiting in the lunch line. In Maine, FSDs perceived that middle and high school girls were less likely to participate in school meals than boys. For example, an FSD in Maine stated, "And then there's certain kids that just simply don't eat, and you know I'm talking about high school girls. There's an awful lot of high school girls that simply don't eat."

3.2.2 | Domain 2: Barriers Related to Student/Parent Preference of Location, Accessibility, and Convenience of School Meals Programs

Two themes related to location and time of the school meal emerged among FSDs in California and Maine: (1) preference for eating breakfast at home or elsewhere; and (2) line length is a deterrent. These themes focused on perceptions that students/parents prefer breakfast to be consumed at home or elsewhere and that school meals are not conveniently accessible.

For most students, particularly younger students, FSDs thought parents often prepared breakfast at home, limiting school breakfast participation. FSDs perceived some students only want to eat food prepared by their parents, and some parents prefer their children to eat meals from home. In addition, FSDs reported parents had a "lack of knowledge" related to school meals, and preferred to prepare meals for their children based on misperceptions of what was being served at school. FSDs perceived some parents may not "trust" others (e.g., cafeteria workers) to prepare meals for their children and/or preferred less processed and more scratch-cooked meals for their children. For older students with greater freedom, many FSDs noted students would stop at quick-service restaurants before arriving at school. In addition, the timing of students' arrival via the school bus played a role in whether they ate school breakfast. If students arrived late, they may not have had time to receive breakfast. However, many FSDs described providing alternative breakfast models such as Breakfast in the Classroom, Second Chance Breakfast, and Grab-and-Go Breakfast to make this meal more convenient for students in the morning.

FSDs perceived that cafeteria lunch lines made school meals less convenient. One FSD in California said, "Long lines, that right now is it. Long lines." FSDs reported that many students were not willing to wait, especially if "the item that they wanted might not be there anymore." Furthermore, FSDs said that schools with short lunch periods and large campuses requiring students to

TABLE 3 | Results from fixed effects logistic regression models from $n = 599$ surveys from FSDs examining the variation in perceptions of student barriers to school meal participation by district enrollment size during the 2021–22 school year in California and Maine.[a]

Barrier to school meal participation[b]	District enrollment size[c] (reference group: high enrollment)	OR	95% CI	*p*
Students do not like the taste of the food	Low enrollment	0.38*	0.22, 0.68	< 0.001
	Moderate enrollment	0.63	0.36, 1.09	0.10
Students do not think the food is fresh	Low enrollment	0.26*	0.15, 0.45	< 0.001
	Moderate enrollment	0.59	0.36, 0.96	0.03
Students or parents do not think the food is healthy	Low enrollment	0.12*	0.07, 0.21	< 0.001
	Moderate enrollment	0.34*	0.20, 0.57	< 0.001
Students prefer to eat a la carte options	Low enrollment	0.31*	0.18, 0.55	< 0.001
	Moderate enrollment	0.85	0.51, 1.43	0.54
Students get tired of the options	Low enrollment	0.33*	0.19, 0.59	< 0.001
	Moderate enrollment	0.63	0.36, 1.10	0.10
Do not meet students' cultural or nonmedical dietary preferences	Low enrollment	0.55	0.33, 0.94	0.03
	Moderate enrollment	0.57	0.35, 0.92	0.02
Portions are not big enough/not enough food provided	Low enrollment	0.46*	0.28, 0.76	0.002
	Moderate enrollment	0.76	0.48, 1.21	0.26
Students prefer to eat meals from home or elsewhere	Low enrollment	0.60	0.31, 1.16	0.13
	Moderate enrollment	0.96	0.50, 1.85	0.90
Students often skip meals (e.g., do not eat any breakfast or lunch)	Low enrollment	0.37*	0.21, 0.64	< 0.001
	Moderate enrollment	0.76	0.43, 1.33	0.33
Students unable to get to school on time for breakfast	Low enrollment	0.19*	0.11, 0.32	< 0.001
	Moderate enrollment	0.39*	0.24, 0.63	< 0.001
Students don't have enough time to get and eat the lunch	Low enrollment	0.09*	0.05, 0.15	< 0.001
	Moderate enrollment	0.41*	0.26, 0.64	< 0.001
Students or parents don't understand that meals are free	Low enrollment	0.30*	0.17, 0.53	< 0.001
	Moderate enrollment	0.69	0.43, 1.10	0.12
Students or parents think only needy kids eat school breakfast and don't want to be thought of that way	Low enrollment	0.24*	0.14, 0.42	< 0.001
	Moderate enrollment	0.77	0.47, 1.25	0.30
Students' friends don't eat the school meals	Low enrollment	0.24*	0.14, 0.42	< 0.001
	Moderate enrollment	0.68	0.39, 1.19	0.18

Abbreviations: CEP = community eligibility provision; CI = confidence interval; FSD = foodservice director; OR = odds ratio.

*Statistical significance at the Bonferroni adjusted $p < 0.007$ level.

[a]Models are adjusted for CEP status and urbanicity, with state as a fixed effect.

[b]Perceived barriers were rated on a scale of 1–3 (1 = None or very few students; 2 = Some students; 3 = Many or most students), but each barrier was dichotomized to assist with model interpretation (0="None or very few students," 1 = "Some students" or "Many or most students").

[c]District enrollment size was categorical 1 = Low Enrollment (i.e., < 1000 students); 2 = Moderate Enrollment (i.e., 1000–4499 students); 3 = High Enrollment (i.e., 4500+ students). Reference group is High Enrollment.

walk long distances to reach the cafeteria made it difficult for students to eat lunch. In these situations, FSDs reported that some students have less than 10-min to obtain and eat lunch.

3.2.3 | Domain 3: Barriers Related to School Meal Preferences

Two themes emerged from FSDs' perceptions in both states related to food: (1) students have negative views about school meals; and (2) school meals were unable to meet students' cultural and dietary preferences and restrictions (California only). These themes highlight the FSDs' perceptions of the mismatch between students' food preferences and school meal offerings.

FSDs perceived that many students had negative views of school meals. FSDs perceived students to think the food served is "gross." One FSD in Maine stated, "I think it has to do with the food. You know whether they like it or not, and whether it's good." As students move into middle and high school, their food choices were perceived to be driven by a developing personal preference for certain foods, as described by an FSD: "I think as you get into sixth grade, even if they ate lunch with us before or not, then they're starting to experience freedom

TABLE 4 | Themes identified through interviews with foodservice directors in Maine and California related to their perceived barriers to students' participation in school meals.

Domain	Theme	California	Maine
Barriers related to the social dynamics of school meals	Peer-pressure and cafeteria anxiety	"I think as they get older, it's their friends that drive them. I had an interesting conversation with a student … and if their friend eats in the cafeteria, then they're going to eat in the cafeteria. But if their friend brings their lunch from home, then they're going to bring their lunch from home. And that's regardless of whether or not it's a free meal program …"	"… if their friends are eating it, or not, you know what their friends do makes a big difference."
		"For my junior high, it just seems to be they're crowded into there. They don't like that they have to go into the multipurpose room. They're being asked not to go out on campus with the food. So they have to sit in the multipurpose room and eat before they go out. And they're too cool for that."	"In the high school and it's like all eyes on them. 'Oh, gosh, I can't eat.' More peer pressure, more comments from kids like 'gee, it doesn't look like you need to eat' or you know it's hard. So, I think it's a combination of they just don't want to eat, or they just think that school lunch is not something they want."
		"Some kids may not like the dining environment and coming in and talking to my staff."	"Some kids have some pretty severe anxiety around cafeterias, or like you know, large gatherings of people like that peer presence."
	School meal stigma	"I will say that our middle school students don't participate because of the stigma that goes along with eating in front of others."	"There's so many factors. 'I don't want to eat school lunch, because I don't want anybody to know I eat school lunch.'"
		"Stigma. I think a lot of it is stigma. Or they have the old perception that school meals suck. And oh, it's so gross … There's just always the stigma still that we just can't shake. And I think that's a big part of why kids don't."	"I think sometimes it's pride, sometimes even though it is free for kids. They still have that mindset that they've got to pay, maybe know that Mom and Dad don't have that kind of money … and again some of it could be the stigma of not wanting people to see them eating at school."
		"At the junior high I think there's a stigmatism. A stigma to not wanting … It's only the poor kids that eat."	"I think there's still some stigma out there that you know, school lunch is for the poor or the free and reduced kids only."
	Grade-level and gender dependent	"The older the student is, the less likely they are to participate … They tell us it's because they don't like the food. I think there's other reasons."	"And then there's certain kids that just simply don't eat, and you know I'm talking about high school girls. There's an awful lot of high school girls that simply don't eat."
		"I think that in high schools they tend to be overbooked, and if they don't have time to go to the cafeteria to eat, they're not going to go to the cafeteria to eat, because a lot of times they're booked with academics, and clubs during the lunchtime too."	"The High School is the hardest one to convince to come to the table. Honestly. The littles, we've got really good participation with all the little schools. The high school kids are always going to be the hard sell."
		"I will say the grade levels is a big one."	"Sixth, seventh and eighth graders, girls particularly, will stop eating because it's time for summer spring dances, prom. That type of thing. High school like I said is the hardest to get. They will sit there and just not eat anything, nothing, nothing, nothing salad, nothing."

(Continues)

TABLE 4 | (Continued)

Domain	Theme	California	Maine
Barriers related to student/parent preference of location, accessibility, and convenience of school meals programs	Preference for eating breakfast at home or elsewhere before school	"I think in terms of breakfast, they eat before they come to school, so they're not as hungry, so they don't participate." "… they're getting dropped-off right at curbside on time and getting to go in and be a little less stressed or they've all stopped at Starbucks or Dutch Bros or whatever on the way, too." "They only want what their mom or dad made them. So I think that's probably the biggest one … Maybe just lack of knowledge of what we serve might be it too because the parents don't know that we're serving some pretty good food. It's not junk food." "I think most of it could be, they have food from home. The parents just pack it or they don't feel like eating that day or they just see our food, but just don't feel they want to eat it." "Well, some families are not. Would rather we have more scratch base. And so, knowing more of what's in the food, so they don't have their kids participate."	"Breakfast is hard. I think some kids just eat breakfast as part of their morning routine with their parents." "Either they have breakfast at home or they just don't wake up. And the other part that we've kind of stopped is before they could just hop off the bus and run out to the playground." "I just think most of my high school kids they're riding into school and they're stopping at Dunkin, and they're getting a coffee and a sandwich and they're not going to come to the cafeteria because they don't need to." "Their parents don't trust anybody to prepare their meals but them, especially with elementary schools, with allergies. It's pretty scary for some parents especially if it's life-threatening. Some it's just that they're into organic, vegan, certain types of food items." "Maybe the parent has a certain way of eating. Some of the kids don't like the commotion, or they'll just bring their little lunch and go in their little corner and have it. We've done a survey before, some of the students may not like what we're serving."
	Line length is a deterrent	"… but the middle schools, they want to chat and not wait in line or anything. That's probably the biggest thing, waiting for their meal and missing out on that socialization time, I think is a big deal." "Some of them say they don't want to wait in line, or that by the time that they get through the line, their favorite item or the item that they wanted might not be there anymore." "Long lines. That right now is it. Long lines."	"When kids have to wait longer in line to get their meals, some will choose not to do that." "They just like to bring their own lunch or some don't want to wait in line. They it's a social time for them. So they just want to get with their friends and not wait in line." "Some don't want to wait in line, it doesn't matter they're never going to wait in line for anything."

(Continues)

TABLE 4 | (Continued)

Domain	Theme	California	Maine
Barriers related to school meal preferences	Students have negative views about school meals.	"That's a good question because we just did a survey on that. They don't like the food. They think it's gross, or they bring their food from home." "I think a lot of times at the younger level it's going to be preference." "I don't like that." Or, "I don't know what that is." I think a lot of times just that, and it tastes different. Our food, as we continue to reduce the fat and the salt and all those things, aren't going to taste like a restaurant. Or they're not even going to taste like the food at home. We have so many restrictions that hold us back from making it taste like what they know.	"I think a lot of it has to do with what they're getting for food. We see kids come through the line and they see what it is and they're like, 'No, I don't want that.'" "Some simply don't eat certain foods you know, and they always are going to bring their lunch from home." "I think it has to do with the food. You know whether they like it or not, and whether it's good." "I've done surveys before they either don't like what we have … They may have some allergies, so they prefer to bring things from home. Some do feel there's a stigma attached to it. But I think not liking what it is probably one of the biggest things."
	Cultural and dietary preferences and restrictions	"I feel like culture has a lot to do with it. And most of those are Hispanics. And if you know Hispanic families, mom's going to make you eat huevos with tortilla before you go to school or they'll make sure you eat something before you head out even if it's a piece of toast." "There's ethnic participation too. So, I have some schools that are higher Spanish population and they tend not to like our Spanish food because they get the good stuff at home. So, they're like, yeah, what you serve is not real taco meat or real stuff." "We have a large Asian and Mid-Eastern community on one side of town. And so there's more vegetarians, more vegans, more cultural asks from one side of town than the other." "Some of the ones with dietary restrictions, who may need meatless options, but can't eat cheese. That's a struggle because very few things credit as a protein that is also meatless." "Using a caterer, sometimes that limits us as to, especially with the Muslim population, one food can't touch another food, or some of our kosher populations, 'I can have a cheeseburger, but my cheese has to be separate,' kind of thing."	

Note: Interviews were conducted with $n = 29$ FSDs in California and $n = 20$ FSDs in Maine.

and they're going to take advantage of that freedom and maybe not eat at all. And they're really driven by what their likes and dislikes are."

In California, cultural and dietary preferences and restrictions were discussed by FSDs as barriers to meal participation. They reported that the lack of culturally appropriate meals served in the cafeteria presented a problem for students. FSDs reported that it was difficult to provide culturally appropriate meals (e.g., vegan, Halal or Kosher) when they relied on external caterers. For example, one FSD in California stated, "Using a caterer, sometimes that limits us … especially with the Muslim population, one food can't touch another food, or some of our Kosher populations, 'I can have a cheeseburger, but my cheese has to be separate,' kind of thing."

4 | Discussion

Despite meals being served free of charge to all students during the 2021–2022 SY, the results of this mixed-methods study suggest that FSDs in California and Maine continued to perceive several barriers to school meal participation. Overlapping perceptions from the quantitative and qualitative data from FSDs who participated in this mixed methods study included students' and parents' negative views of the food provided at school, preferences for alternative meal locations, inadequate time to eat school lunch, and stigma. These results are similar to previous studies examining student barriers to school meal participation prior to COVID-19. During the 2014–2015 SY, the USDA assessed reasons for student participation in school meals as part of the School Nutrition and Meal Cost Study conducted with school food authorities, schools within the school food authorities, and a sampling of students within those schools [31]. The most common reasons for student non-participation in school meals included student and/or parent preference for meals from home, students' general dislike of the taste of school meals, inconvenience, and insufficient time to eat [31].

Related to students' and parents' negative views of the food provided at school, more than half of FSDs perceived that students or parents did not think the food is healthy and this was particularly the case for FSDs in non-CEP schools and FSDs from districts with low and moderate enrollment. The qualitative data corroborates these findings and highlights the challenges FSDs perceive in appealing to students' tastes and preferences (i.e., negative views about school meals, preferences for food from home and cultural and dietary preferences and restrictions). Similarly, O'Donnell and colleagues conducted focus groups with students and caregivers related to meal offerings and reported that the freshness and quality of the school food served was important [32].

Related to alternative meal locations, in non-CEP schools, FSDs more often reported perceiving that students preferred to eat meals from home or elsewhere. This perceived barrier was also discussed by FSDs in the interviews, with many perceiving that students only want to eat meals prepared by their parents, or parents did not trust others to prepare meals for their children. A study assessing parental perceptions of the nutritional quality of school meals similarly found parental perceptions to be related to students' school meal participation [33]. FSDs also perceived students acquired breakfast from local quick-service establishments before arriving at school, which is similar to a qualitative study conducted in California that found many FSDs perceived adolescent students preferred to eat foods off-campus [34].

FSDs from districts with low and moderate enrollment perceived time to eat lunch as a statistically significant barrier to student participation compared to those from districts with high enrollment. To provide greater context for this perceived barrier, the qualitative data indicated that with greater school meal participation, there were longer lunch lines. FSDs perceived that the longer lunch lines deterred students from participating in school lunch because students would not have enough time to eat after waiting. Similarly, a qualitative study conducted in California in the context of meals being free of charge to all students also identified lack of convenience to be a barrier to student participation in school meals; specifically, the length of the lunch line and limited time to eat [34]. This points to the need for a federal policy for lunch period length to ensure students have a minimum of 20 min to eat lunch [35].

Finally, the results also indicate that FSDs perceive stigma is a barrier to students' school meal participation. In non-CEP schools (which may include schools with both students from low-income and high-income backgrounds), FSDs perceived that students or parents believed only needy kids eat school breakfast. This was similarly expressed by FSDs in the interviews. Despite meals being served free of charge to all students, students or their parents did not want them to eat the meals as they continued to feel they would then be viewed by other students or parents as a family from a low-income background. These sentiments have been documented throughout COVID-19 and found that stigma was perceived to negatively influence participation in school meal pick-up during the pandemic [36, 37]. One study found greater challenges in higher-income districts where students did not want to be seen as "the poor kid in town" [37].

4.1 | Implications for School Health Policy, Practice, and Equity

To reduce hunger and improve child nutrition, the White House Conference on Hunger, Nutrition, and Health made USM a priority over the next decade, and the USDA recently proposed a new rule to expand CEP to more schools [38, 39]. The USDA has also recently announced updated nutrition standards (e.g., limiting added sugar, and reducing sodium) to make school meals more healthy by aligning meal requirements with the 2020–2025 Dietary Guidelines for Americans [40]. In these emerging contexts, it is critically important to understand how to make healthy meals appealing to students. To make school meals more convenient for students, schools could extend lunch periods, allowing students more seated time to eat and could provide multiple locations for students to obtain their meals. To increase convenience and access, initiatives such as Breakfast After the Bell, as discussed by the FSDs, could be implemented for students who arrive at school with little time to eat breakfast before school [41]. To improve the food served in schools, greater investments could be made at the federal level to facilitate

schools' ability to access the resources they need to improve the palatability and variety of foods served to students (e.g., less processed and more scratch-cooked). At the state level, more funding could be allocated to schools to purchase equipment and provide training for staff to cook more scratch-based meals for students. Last, to reduce stigma, the federal government and/or additional states could implement USM policies, thereby reducing the stigma associated with eating school meals.

4.2 | Limitations

This study is based on data collected from schools that were participating in USM programs in two states, California and Maine, and may not be generalizable to schools in states not offering universal free meals, or those that are demographically different. It is important to note that while the states of California and Maine are different geographically, demographically, and in population size, the findings in each were similar. Next, the quantitative analyses were unable to adjust for potential confounders such as racial and ethnic composition and school income level. Furthermore, as a cross-sectional study, this study represents a single time point when meals were served free of charge to students. In California, the CDE sent out survey invitations potentially biasing the sample, as the CDE oversees and monitors the school meal program in the state. However, FSDs were clearly informed that their identifiable information would not be shared. Additionally, the sample size in California was much larger than in Maine (as less FSDs were recruited from Maine than California for the sample to be reflective of each state's population size and demographics) so results may have been largely driven by FSDs in California. Finally, the perceptions of FSDs may not accurately reflect the perceptions of students, however, the opinions of FSDs are still useful as they oversee all aspects of school districts' nutrition programs. Future research should include students to understand the barriers to participating in USM.

5 | Conclusions

FSDs in two states (i.e., California and Maine) offering free meals to students identified multiple barriers to school meal participation, including those related to negative student or parent perceptions of the food served, location and timing of the meals, and other social barriers associated with participating in school meals. To effectively address these barriers and ensure that all students have access to nutritious meals, it is essential for policy makers and school administrators to consider investing in comprehensive strategies that include improvements in meal quality, mandated time to eat, and targeted interventions to improve social barriers (e.g., reduce stigma) related to school meals.

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Ethics Statement

The study was approved by the Institutional Review Boards of Merrimack College and the University of California, Davis (IRB Protocol: IRB-FY21-22-19, approved January 14, 2022).

Conflicts of Interest

The authors declare no conflicts of interest.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1.**