

Plate Waste in School Lunch: Barriers, Motivators, and Perspectives of SNAP-Eligible Early Adolescents in the US

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ABSTRACT

Objective: To determine barriers, motivators, and perspectives regarding plate waste reduction of early adolescents.

Design: Trained interviewers conducted audio-recorded individual interviews with adolescents.

Setting: Elementary schools implementing the *National School Lunch Program* in Hawai'i, Montana, and Virginia.

Participants: Early adolescents (n = 47, aged 9–13 years) from families receiving or eligible to receive *Supplemental Nutrition Assistance Program* benefits were recruited to participate.

Phenomenon of Interest: Factors influencing plate waste among adolescents and potential plate waste reduction strategies.

Analysis: Coders analyzed content and thematic data to identify code categories and themes.

Results: Main barriers to reducing school lunch plate waste were unsupportive school policy, undesirable food quality, satiation, and social influences. Key motivators to reducing school lunch plate waste were supportive school policy, including allowing students to share food with peers and save food to eat later; and social influences. Participants found it acceptable to throw away disliked food and unacceptable to throw away wanted food; they perceived that their peers did not care whether food was thrown away; and they thought their parents disliked wasting food.

Conclusion and Implications: Results suggest that several factors might allow for minimization of school lunch plate waste in the *National School Lunch Program*, including improvements in food quality, food policy, and social influences. Under these important themes, strategies to employ may include improving food preparation and taste, allocating more time for students to finish lunch, allowing students to self-select food lunch items, and permitting them to share and save their leftover food.

Key Words: early adolescents, food waste, *National School Lunch Program*, plate waste, school lunch (*J Nutr Educ Behav.* 2019; 51:967–975.)

Accepted May 12, 2019. Published online June 20, 2019.

INTRODUCTION

Poor diet is particularly of concern for low-income students eligible for

federally assisted meal programs such as *Supplemental Nutrition Assistance Program* (SNAP), who have been shown to be at increased risk for

diet-related conditions such as overweight and obesity.¹ School is an important setting for promoting a healthy diet, because students consume a significant number of daily calories in this setting. Although students may be provided meals meeting the dietary guidelines² at school, school lunch plate waste may negatively affect dietary intake and lead to inadequate intake of important nutrients. School lunch plate waste not only affects lunch quality and students' nutritional intakes in school, it causes problems beyond school, such as excess methane and CO₂ emissions in the environment, which may have an impact on global climate change.³ Besides the nutritional and environmental cost of plate waste, the economic cost of

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Conflict of Interest Disclosure: The authors have not stated any conflicts of interest.

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<https://doi.org/10.1016/j.jneb.2019.05.590>

plate waste nationally is over \$600 million/y.⁴ Hence, it is important for foods served in schools to meet the nutrition standards and for plate waste to be minimized to optimize students' nutrient intakes and minimize environmental and economic costs.⁵ Completely eliminating school lunch plate waste likely is unrealistic; however, understanding factors related to reducing lunch plate waste is important for efficiency, cost, and nutritional intake of students.⁶

To the authors' knowledge, no known studies have explored barriers, motivators, and perspectives regarding reducing plate waste in schools through interviews with low-income children eligible for SNAP. Identifying factors contributing to plate waste in school has the potential to improve food consumption. Understanding barriers and motivators for plate waste reduction may result in improving participants' eating behaviors, tailoring nutrition education programs, and minimizing school lunch plate waste.⁷ This study was designed to document barriers, motivators, and perspectives regarding plate waste in schools to inform strategies to reduce plate waste.

METHODS

Participants and Recruitment

Participants were early adolescents, aged 9–13 years, from families receiving or eligible to receive SNAP benefits in Hawai'i, Montana, and Virginia. Researchers at each institution had previously collaborated on school lunch plate waste research.⁶ This multisite recruitment process benefits the study to learn about a diverse range of experiences of students' lunch consumption and offer a high-quality and more multi-ethnic and representative sample. Non-SNAP receiving students were not included in this study, and it is not defined in this research whether there were significant differences in plate waste between those who were eligible for SNAP and those who were not. Researchers recruited students from elementary schools implementing federally assisted meal programs by contacting after-school

programs and then approaching parents when they came to pick up their children; they also distributed flyers. Adolescent participants were diverse in ethnicities, included white, Native Hawaiian or other Pacific Islander, Asian, Hispanic, black/African American, and American Indian or Alaskan Native. Students were recruited separately from Hawai'i, Montana, and Virginia. In Hawai'i, children were recruited from 3 different schools, which were kindergarten (K)–6 (314 student enrolled in 2016–2017, urban), K–8 (423 student enrolled in 2016–2017, urban), and K–12 (359 students enrolled in 2018, rural). At this site, all students received free or reduced-cost meals. In Virginia, participants were recruited with the help of a community member in a rural area in which most schools had high rates of free and reduced-cost meal programs. The Montana site data came from 2 elementary schools. Both had 250 students and were located in an urban-rural area. At the first school, 60.5% of students received free or reduced-cost lunch through the *National School Lunch Program* (NSLP). The first school had 18% students eligible for free and reduced-price lunch in the NSLP and used offer vs serve (OVS). The second was oriented with offer vs serve but only 11% of students were eligible for free and reduced-price lunch through the NSLP. Parents and participants signed consent and assent forms, respectively. The researchers explained the forms verbally to the parents and participants before they signed. This study was approved by the Institutional Review Boards at the University of Hawai'i, Montana State University, and Virginia Polytechnic Institute and State University.

Procedures

Semistructured interviews. At each site, trained research assistants conducted interviews using a semistructured interview guide that was originally pilot-tested with 3 participants at the Hawai'i site. Interviews were selected as the data collection method rather than focus groups because the researchers were interested in concepts regarding lunch plate waste

that may be unique to individual students, such as personal perspectives, as well as those of peers and parents. The interview guide was developed by the lead researcher in Hawai'i by reviewing existing literature on school lunch plate waste in the US. Existing literature was reviewed for factors associated with plate waste in quantitative studies and any proposed strategies to reduce lunch plate waste. The interview guide was further reviewed and approved by the lead researchers in Montana and Virginia. Examples of questions asked were *When you finish lunch, is there ever food left on your plate? If so, why? What type of food is usually left on your plate? What happens to this food? Why?* Interviewers followed up with probes as to why food was discarded. The interview guide focused on prompting students to state their perceptions regarding factors contributing to school lunch plate waste. The [Supplementary Table](#) provides an example of questions posed with regard to lunch at school. The lead researcher at each institution, who had extensive experience in qualitative data collection, trained research assistants at each site. All one-to-one interviews with participants were conducted using the interview guide and audio-recorded. After each interview, researchers at the Hawai'i site listened to the recorded interview to see whether new ideas emerged from the interviews. If there were any, these were added as new codes to the codebook. Once each interview was finished, 1 researcher listened and transcribed the interviews and a second researcher checked that each interview was transcribed correctly. Once transcribed, all transcripts were imported into NVivo qualitative data analysis software (version 10, QSR International, Inc, Burlington, MA; 2012).

Data Analysis

Directed content analysis was used to analyze interview transcripts using NVivo. One researcher in Virginia and a second one in Hawai'i coded 3 randomly selected transcripts to ensure interrater reliability and achieved a mean Cohen kappa coefficient of 0.68, which is considered a

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