Plate Waste and Student-Reported Reasons for Food Rejection in a High School National School Lunch Program Cafeteria

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Introduction

Food waste is a significant challenge in the United States, with an estimated 30 to 40% of all food produced going unconsumed, accounting for roughly 22% of material in municipal landfills (RTS, 2026; USDA, 2026). Within the National School Lunch Program (NSLP), approximately 30% of food provided goes uneaten (Shanks et al., 2017). Research on food rejection indicates that distaste driven by unfavorable taste, smell, or texture is the most common reason individuals reject food (Rozin & Fallon, 1980), with subsequent frameworks building on this foundation to organize the determinants of food choice and intake into sensory, individual, and contextual factors (Chen & Antonelli, 2020; Eertmans et al., 2001). In school settings, food quality has emerged as the primary barrier to eating school lunch among middle school students, with dissatisfaction with taste, texture, and smell reported alongside limited time to eat and lack of choice (Zhao et al., 2019). Schools commonly use food waste audits to document plate waste (Adjapong et al., 2024 ; Wilkie et al., 2015), yet student-reported reasons for not eating are less systematically examined. Program-level reports capture responses descriptively without organizing them into patterns that can inform targeted waste reduction strategies (Adjapong et al., 2024). This study aimed to examine student-reported reasons for not consuming school lunch in a high school NSLP cafeteria.

Conceptual Framework

This study was guided by the food choice determinants framework developed by Chen and Antonelli (2020), which organizes determinants of food choice and intake into five factors: food-internal (sensory and perceptual features such as taste, texture, and quality), food-external (factors outside the food itself, including food-related information such as labels and advertising, social influences such as family and peers, and physical access and availability), personal-state (physiological needs and biological features such as hunger and health), cognitive (mental judgments about food including attitude, personal liking and preferences), and sociocultural (cultural norms, economic variables, and political elements). Although the framework was developed to explain food choice and intake, the same determinants that shape whether food is chosen also to govern whether it is consumed or left behind, making it applicable to examining plate waste reasons. Three factors food-internal, personal-state, and cognitive aligned most directly with student-reported reasons. Food-external factors were partially present, limited to physical environment responses such as time constraints and policy required food selection. Sociocultural factors were absent, as students had no control over what was served; cost was not a consideration within the NSLP.

Methods

Data were collected as part of Food Flow: Cultivating Health, Minimizing Waste, a program focused on addressing food loss and waste through education and learning experiences at a National School Lunch Program (NSLP) participating high school in the Houston Independent School District (HISD). Two food waste audits were conducted: Audit 1 on October 17, 2024, and Audit 2 on April 7, 2025, following the Environmental Protection Agency (EPA) guide for conducting student food waste audits (Terry et al., 2017). During each audit, uneaten food was collected from student trays across all four lunch periods, sorted by food category, and

weighed. Student-led teams simultaneously conducted brief interviews, asking students a single open-ended question about why they did not finish a specific food item, with responses recorded verbatim. A total of 447 student responses were collected across both audits; 416 were retained for analysis after removing entries with no recorded reason. Student-reported reasons were analyzed using directed content analysis (Hsieh & Shannon, 2005), with initial coding categories informed by Chen and Antonelli's (2020) food choice determinants framework. Responses containing more than one distinct reason for food rejection were separated into individual coding units prior to analysis.

Results

A total of 457 coded reasons for food rejection were identified through directed content analysis. Food-internal factors accounted for 61.5% of responses, followed by cognitive (21.0%), personal-state (12.5%), food-external (1.8%), and uncoded responses (3.3%). Within food-internal factors, sensory features were the predominant subfactor, with students frequently citing taste, texture, dryness, sogginess, and bad taste, while perceptual features reflected concerns about *bad presentation and unappetizing*. Within cognitive factors, attitude, liking, and preference subcategory predominated, reflected in responses such as *doesn't like, didn't want, just wanted chips, and preferred grapes,* while a smaller number of responses reflected knowledge and familiarity, including *unfamiliar food and doesn't know what it is.* Personal-state factors responses primarily reflected physiological needs subcategory, such as *full and not hungry,* with fewer responses related to biological features sub-category, including *sick, allergies, and lactose intolerance*. Food-external responses were limited and primarily reflected the physical environment sub-category, including *didn't have time to eat* and *want more options.* A small proportion of responses did not align with the food choice determinants framework and included ambiguous or outcome-oriented statements such as *forced to take*, and *throwing away all lunch*.

Conclusions

The predominance of food-internal factors suggests that students' willingness to eat school meals depends largely on the food's sensory and perceptual qualities, particularly its taste, texture, and appearance, highlighting the importance of meal quality in National School Lunch Program menu planning. The findings related to cognitive factors indicate that students' attitudes, preferences, and familiarity with foods also influences meal acceptance, whereas hunger, health conditions, and cafeteria conditions appear to play comparatively smaller roles. Together, these findings demonstrate that examining student-reported reasons alongside quantitative food waste audits provides insight into why food is rejected, complementing traditional measures that quantify the amount of food discarded.

Implications

School nutrition professionals and cafeteria managers can address this issue by enhancing the sensory quality and presentation of meals and incorporating student feedback into menu planning. Expanding opportunities for student choice where feasible may further reduce rejection of foods students would not otherwise select. For agricultural education and school sustainability initiatives, student-led food waste audits that capture student-reported reasons offer a practical, evidence-based model for informing targeted waste reduction efforts.

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