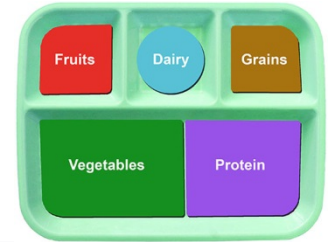


Plate Waste



ISSUE

How have school food service directors minimized plate waste in school meal programs while implementing provisions resulting from the Healthy, Hunger-Free Kids Act of 2010 (HHFKA)?

BACKGROUND

HHFKA required the U.S. Department of Agriculture (USDA) to issue new science-based nutrition standards to improve the nutritional quality of school meals. The standards are based on the recommendations of the Institute of Medicine¹ and are aligned with the 2010 Dietary Guidelines for Americans. The lunch standards specify weekly and daily requirements for low/non-fat fluid milk, fruits, vegetables, meat/meat alternates, and whole grain-rich items. The standards also set specifications for calories, sodium, saturated fat, and *trans* fat. Similar requirements apply to school breakfasts.

For menu planning and meal service, USDA encourages the use of the Offer versus Serve option, which allows students to select the foods they want to eat, thereby reducing food waste (plate waste). USDA has updated the 2004 Offer versus Serve guidance to align it with the HHFKA-related meal requirements, and plans to revise it further as needed to reflect additional requirements as they are phased in. See Table 1 for a summary of changes to Offer versus Serve.

Although plate waste also occurs in settings outside of school meals, it is one measure of how successful school meal programs are in getting students to eat the foods being served. Results from a national study of plate waste in school lunchrooms conducted more than 20 years ago revealed that approximately 12 percent of the calories from school meals and up to 15 percent of the individual nutrients were not being eaten.²

Although there is no acceptable level of plate waste, reductions in plate waste, particularly for under-consumed items such as fruits and vegetables, may be indicators of increased selection and effective program delivery.

Table 1. Summary of Changes to Offer versus Serve Under HHFKA

2004	2013-2014
Breakfast	
Optional at all grade levels.	Optional at all grade levels.
Reimbursable breakfasts had to offer 3 or 4 components in 4 food items.	Reimbursable breakfasts must offer 3 components in 4 food items.
Students could decline 1 food item.	Students must select at least 3 food items; 1 selection must be at least ½ cup of fruit.
Juice, fruit, and vegetables counted as 1 component; school had to offer 1 food item in this component; students were not required to select a juice, fruit or vegetable.	Beginning school year 2014-2015, the component is fruit; students must select at least ½ cup of fruit.
Students were allowed to take a double serving of grains and meat/meat alternate component only.	Students are allowed to take a double serving of fruit and grains components; credited meat/meat alternate when substituted for grains.
Lunch	
Mandatory at high schools and optional at lower grade levels.	Mandatory at high schools and optional at lower grade levels.
Reimbursable lunches had to offer 4 food components in 5 food items.	Reimbursable lunches must have 5 components.
High school students had to select 3 food items; SFA could require selection of 3 or 4 food items at lower grades.	Students at all grade levels must select at least 3 components; 1 component must be ½ cup of fruit or vegetable.
Fruits and vegetables counted as 1 component; 2 food items had to be offered under the food component; students were not required to select the component.	Fruits and vegetables count as separate components; students must select at least a ½ cup of fruit or vegetables or a total of ½ cup of both.
Double servings were not allowed.	Double servings are not allowed.

“It’s not nutrition if they’re not eating it.”

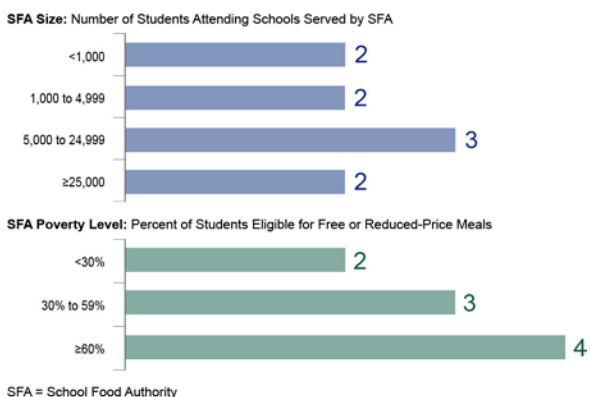
1. Renamed the National Academy of Medicine effective July 1, 2015.
 2. USDA Economic Research Service (2002). Plate Waste in School Nutrition Programs: Final Report to Congress. <http://www.k12.wa.us/Finance/pubdocs/PlateWasteInSchoolNutrition.pdf>.



“You can’t get away from the real basics of our job, which is making food look flavorful and very presentable when kids see it on the line. We can meet portion sizes and meet all of the components and even serve a variety of foods, but if the food is not good quality, and if we aren’t making it look good and present it nicely, and if it doesn’t taste good, there is nothing that’s going to make those kids eat their food. So just never stray too far from the basics.”

The findings presented in this research brief include an overview of school food service directors’ perceptions about plate waste as they transitioned their programs to meet the new meal patterns and nutrition requirements prompted by HHFKA, a summary of the strategies that directors have used to overcome challenges and minimize plate waste while implementing the provisions in their school districts, and recommendations for technical assistance. The information comes from semi-structured discussions conducted by telephone (focus group or individual interview) with nine school food service directors in April 2015. Although the participants are not statistically representative of all directors, the qualitative data collection technique was particularly suited to gaining in-depth understanding of how directors implemented HHFKA. See Figure 1 for a summary of the size and poverty level of the school food authorities (SFAs) represented by these directors.³

Figure 1. Characteristics of School Food Authorities (SFAs) Represented by Participating School Food Service Directors



3. This brief also includes strategies cited by directors who participated in focus group discussions and telephone interviews for research briefs in this series on other aspects of HHFKA implementation, including whole grain-rich foods, fruits and vegetables, sodium, Smart Snacks, student participation, food service revenue, and childhood obesity.

KEY FINDINGS

School food service directors in this study said plate waste increased initially, but they successfully reduced the amount of waste for fruits and milk during school year 2013-2014 to levels comparable to pre-HHFKA levels. The directors cited three main challenges in minimizing plate waste in their districts: (1) accommodating student taste preferences and unfamiliarity with menu items, (2) helping students deal with early meal schedules and insufficient time to eat, and (3) redistributing uneaten, intact items.

Directors described successful strategies that helped them address these challenges, including:

- Involve students in menu planning and conducting taste tests, implement Offer versus Serve at all grade levels, provide more menu choices, serve foods with familiar flavors, serve ready-to-eat fruit, and invite school staff and teachers to eat meals with students.
- Encourage principals to schedule recess before lunch, encourage students to keep food items for snacks, offer grab-and-go items, and serve breakfast in classrooms.
- Offer sharing/trading tables and donate intact items to local food banks.

Technical assistance in minimizing plate waste should include staff training on using well-tested recipes, strategies for marketing school meals to students and reducing plate waste, strategies for obtaining support from school personnel, and strategies for implementing sharing tables and donating food to community organizations.

OVERVIEW OF THE TRANSITION PROCESS

Plate Waste Prior to HHFKA

Most school food service directors who participated in this study reported using the Offer versus Serve option in all of their schools prior to HHFKA. Offer versus Serve was mandatory at the high school level for lunch, but optional at lower grade levels, and was optional for breakfast at all grade levels. Directors agreed that Offer versus Serve allowed SFAs to reduce the number of food components that a student had to take for a meal to be counted as reimbursable. Directors noted that Offer versus Serve was particularly important for free and reduced-price meals, for which SFAs receive a higher Federal reimbursement to cover the cost of providing the meal to students.

School food service directors said that prior to HHFKA, plate waste varied by grade level and meal service, with more waste in the lower grade levels, at lunch, and during the first half of the school year. A few directors said that students waste more at the beginning of the year, because it takes them longer to get through cafeteria lines and they have less time to eat their meals. As students learn the process, the time to get through the line shortens and they are able to eat more of their meals, therefore less is wasted.



“Waste tends to be higher at the beginning of the year. It takes kids longer to go through the line, so they have less time to eat and more gets thrown away.”

School food service directors noted that the most common leftover items were fruits, vegetables, and milk. One director noted that prior to HHFKA, students who reached the cashier with only two items would be sent back to get milk so they had the required three food items. Cafeteria staff often saw unopened milk cartons sitting around the cafeteria or thrown into the trash.

“Now, sometimes I think the quantity of the food we give to the kindergarteners, first and second graders, is probably too much for them to actually consume in one sitting, especially for breakfast.”

School food service directors described several approaches they used to prevent early lunch periods and insufficient time to eat from contributing to plate waste. A few directors served breakfast in classrooms, offered grab-and-go lunches, and worked with principals to schedule recess before lunch at elementary schools.

Plate Waste After HHFKA Implementation

School food service directors in this study said that transitioning to HHFKA led to increased plate waste for vegetables and whole grain-rich items. Most of the directors reported that over time they have observed increased uptake and less waste for whole grain-rich items and vegetable subgroups. These directors said that improved product formulations helped reduce plate waste, noting that the whole grain-rich bread, rice, and pasta offered in the early stages of HHFKA implementation were not well accepted. Increased use of a blend of whole grain-rich and enriched grains resulted in greater student acceptance and less waste.

Noting that students tend not to like red and orange vegetables, school food service directors shared suggestions for offering these vegetables without increasing waste. For example, directors served carrots and sweet potatoes in a variety of forms. One director offered steamed carrots, raw carrots, and blended carrots in cooked entrées. Another director served “confetti fries” (sweet potato fries mixed with regular fries), and another served a savory sweet potato pie.

Although the school food service directors reported that plate waste increased initially, they succeeded in reducing the amount of plate waste observed for fruits and milk dur-

ing school year 2013-2014 to levels that were comparable to the levels prior to HFKA.

“For us, basically the fruits and vegetables [are being wasted] because now they are required to take the fruits and vegetables at breakfast. That’s a lot of food for the young people, the full cup of fruit, and so we offer a juice along with maybe the frozen fruit.”

STRATEGIES FOR MINIMIZING PLATE WASTE

School food service directors who participated in this study cited three main challenges in their efforts to reduce food waste in their schools:

1. Accommodating student taste preferences and unfamiliarity with menu items,
2. Helping students deal with early meal schedules and insufficient time to eat, and
3. Redistributing uneaten, intact items.

Directors described successful strategies that helped them address these challenges, as summarized below.

Challenge 1: Accommodating student taste preferences and unfamiliarity with menu items

✓ **Obtain feedback on new menu items.** School food service directors noted that it takes time to identify new food items that students will accept. Many directors said that a key factor in getting student buy-in and acceptance of new school menus was to involve students in the decision-making process by openly discussing menu changes and getting their feedback about new products. Directors said they typically review their menus approximately every 2 months to consider which items students prefer. To find new items that students like, directors said they used approaches such as allowing students to sample foods through organized taste tests or by offering samples during the lunch period.

School food service directors said they conducted taste tests in a variety of ways, depending on the amount of sample product available and the type of product. Taste tests might be done in home economics classes, with students at a particular grade level, within one school, or across the entire school district. Students gave verbal feedback or filled out brief written surveys about new products.

One school food service director reported that she meets with high school students monthly to see what they like and do not like on the menu.



“You put bananas out there a day or two after you get them, because if they’re starting to speckle, kids are not going to eat it. They may take it on the tray, they may pull it off the salad bar, but kids eat with their eyes like you and I do, so we try to make everything very pleasant-looking and just delicious-looking.”

One school food service director described their efforts to communicate with students about not taking food unless they plan to eat it. To reinforce that message, they posted a picture of a trashcan on the wall with the message, “Please don’t feed Corey the Trashcan your fruits and vegetables.” Subsequently, custodians reported that students were throwing away less food.

✓ **Implement the Offer versus Serve option across all grade levels.** Although Offer versus Serve is mandatory at the high school level, it is optional at lower grade levels. Many of the school food service directors said they also implemented Offer versus Serve in lower grades to help reduce waste. One director noted that teachers in the lowest grades (kindergarten, first grade, and second grade) placed all items on the trays for their students. The teachers made sure students took everything, which often resulted in a lot of waste because students did not eat all of the food. The amount of plate waste was much lower in grades where students were allowed to select fewer items.

“We do Offer versus Serve, they don’t have to take milk, and I’m noticing more kids don’t take milk now.”

All of the school food service directors using Offer versus Serve in lower grades suggested that it helped reduce the amount of plate waste. Students can decline items they do not want, as long as their plate meets component requirements for the reimbursable meal.

✓ **Provide more choices.** Several school food service directors emphasized the importance of offering students a variety of choices so they could find something they like. They also mentioned the need for sensitivity about special diets as well as cultural and ethnic differences, noting that this encourages participation and reduces plate waste.

“So, if I have pork teriyaki one day over brown rice, I’m going to have another item so that my kids

who don’t eat pork will be able to pick something else.”

One school food service director from a small school district said that their vendor provides just one menu selection each day, and there is a lot more waste on days when students do not like what is offered.

School food service directors advised against offering the same foods too often. One director described a policy of never offering a particular item more than once a week. Another director noted that her approach was to mix and match items so the same menu would not appear twice in the same month, even though individual items might appear multiple times.

“We try to plan our menus with a lot of diversity and a lot of respect to special diets, as well as trying to plan it for those things that kids will eat.”

In school districts that have diverse ethnic populations, or both rural and urban areas, school food service directors noted that student food preferences differ among schools. These directors said it is important to consider what students in each school like and do not like, and to develop menus based on those preferences. One director noted that students in rural schools in her district eat more fruit and like green salad, while students in the urban schools prefer yogurt and fruit trays.

✓ **Serve foods with familiar flavors.** School food service directors said they try to offer foods to students that they are likely to recognize. For elementary schools, in particular, directors said they plan menus based on items that one director called “bring them in” items—foods that students are likely to eat, such as pizza, crispy chicken sandwich, and tacos. Several directors remarked that students are savvy customers, and said it is important to provide products they like in order to maintain participation.

“Between all of this, we obviously want to feed children, and I want them to eat the food that they could select.”

Based on the results of preparing foods in different ways, several school food service directors reported that their students preferred roasted vegetables. Other directors said they have found that students are more likely to try foods when served with something familiar, such as ranch dressing with fresh vegetables.



“Roasted vegetables are much more popular than anything that’s steamed or boiled or broiled.”

School food service directors noted that student taste preferences change with age. In general, they said, younger students prefer simple foods, while older students tend to like spicy foods. Several directors said spices make foods appealing to older children. All directors agreed that pre-packaged low-sodium ketchup and ranch dressing worked well with younger students. For older students, directors said they have set up spice or flavor bars where students can add herbs, spices, or other seasonings to their foods.

“At the end of line, they can pick seasonings to put on their vegetables or their meat. They could put it on whatever they want to. It can be things like red pepper flakes, banana peppers, hot sauce, and vinegars. Sometimes it can be a sauce if it falls within our guidelines, and they can add flavor to their items as they want to.”

✓ **Serve ready-to-eat fruit.** School food service directors noted that children may need considerable time to eat some types of fresh fruit. This is particularly true for oranges and other fruits that require peeling. One director pointed out that younger students often have difficulty eating whole pieces of fresh fruit. For elementary school students who are missing front teeth, it can be difficult to bite into fruits such as apples, pears, or peaches. As a result, these students may end up throwing away the fruit. Directors suggested serving prepared, ready-to-eat fruit to avoid this problem.

“Most of those kids in kindergarten and first graders and second graders, they’re probably missing those upper teeth, so how are they going to eat that apple? So you need to slice it.”

✓ **Invite school staff and teachers to eat meals with students.** School food service directors noted that although school staff and teachers are not their “primary customers,” obtaining their buy-in is important. Several directors commented on the lack of positive role models in the cafeteria who can encourage students to eat their meals and explain the importance of eating fruits and vegetables. A few directors said that students ate better and complained less when school staff and teachers ate with students in the cafeteria.

“We try to work hand in hand with the parent groups and with our administration. ... We have an administrative council meeting with all the principals and directors once a month, and I always try to bring some of the new items we’re trying, so they’ll see what we’re going to be serving, and that helps out. You want them on your side, so it works out well.”

Most of the school food service directors were not aware of any instances of school staff and teachers eating with students, but one director said he and the teachers at one small elementary school in their district routinely eat with students. During this time, teachers talk with students about the importance of eating healthy fruits and vegetables. The director suggested that this has led to a reduction in plate waste.

“We have no adults eating with their children any longer. When I grew up, an adult ate with me and encouraged me to eat.”

✓ **Reward students for trying new foods.** Some school food service directors said that they gave students a voucher for a free afternoon snack if they ate a new product. Another director said a wellness coach talked with children about new foods, and staff gave certificates of recognition to students who tried new foods. One director said his staff encouraged students in the lunch line to try new food items.

One school food service director described their strategy of offering samples to students on “Try It Tuesdays.” On Tuesdays, all schools prepare portion cups with samples of an item and pass them out in the cafeteria while students are eating. Any student can try the sample, including those who brought their lunch from home. Students who try the sample get a sticker that says they are a “super food taster.” Cafeteria staff ask students whether they like the food, and use the feedback to decide which foods to add to the menu.

“As soon as you bring those samples out, the kids just start screaming. They just think it’s just so much fun, and then they get a sticker saying that they’re a ‘super food taster.’”



Challenge 2: Helping students deal with early meal schedules and insufficient time to eat.

✓ **Encourage principals to schedule recess before lunch.** Some school food service directors cited the timing of recess and lunch for elementary school students as a factor in plate waste. The directors noted that students who have recess before lunch are hungrier and more likely to eat everything on their plate. Other directors suggested that when recess is scheduled after lunch, students may discard some of their lunch in order to get outside sooner.⁴

“So when you have recess first, they come in and they’re not really in a big hurry to get back in class, and so they’re more apt to eat their food and not be in such a rush just to press it all down so fast.”

✓ **Encourage students to keep food items for snacks.** One school food service director said they encourage students to take their fruit with them after lunch if it is untouched. The students can eat the fruit as a snack after school. This is helpful for students who participate in after-school activities.

“In the past, [State] has been very strict about not allowing any food to leave the cafeteria. So because USDA is encouraging that fruit be taken after lunch out of the cafeteria to be used at the ... football practice time or something – because of that, [State] has relaxed the standards a little bit, and so we’ve gone along and encouraged students to take that piece of fruit with them.”

✓ **Offer grab-and-go items.** School food service directors said they offered grab-and-go items—packaged foods that are ready for students to pick up—and did so more often in high schools than in lower grades. One di-

⁴ Bergman, E.A. et al. The relationship of meal and recess schedules to plate waste in elementary schools. *The Journal of Child Nutrition and Management*, Vol. 28, No. 2, Fall 2004. Available at: <http://docs.schoolnutrition.org/newsroom/jcnm/04fall/bergman/bergman1.asp>.

Getlinger, M., Laughlin, C., Bell, E., Akre, C., & Arjmandi, B. (1996). Food waste is reduced when elementary-school children have recess before lunch. *Journal of the American Dietetic Association*, 96, 906-908.

Read, M., & Moosburner, N. (1985). The scheduling of recess and the effect of plate waste at the elementary school level. *School Food Service Research Review*, 9, 40-44.

rector noted that some high schools have just one lunch period and must serve 2,000 students. Students do not want to stand in a long line and then not have enough time to eat. By having multiple lines and offering prepackaged grab-and-go items, the cafeteria can move students through more quickly so they have time to enjoy their meals.

“Even though we do have Offer versus Serve in all of our grades, I think it’s still a very hurried time at breakfast and you have to eat very quickly. I think often things are wasted simply because of the time available.”

Another school food service director took the grab-and-go concept a step further. Because of changes in bus schedules, students did not have enough time to go to the cafeteria to eat breakfast. But there was opposition to serving breakfast in the classroom, so the director decided to take breakfast to the students. She received approval and implemented “Breakfast on the Ramp.” She purchased food carts and set them up on the bus ramp so students could grab breakfast as they got off the bus and headed into the school.

“So we started setting up breakfast carts out on the bus ramps, and the child gets the breakfast literally as they’re getting off the bus and running into class. It’s just working with what you have.”

✓ **Serve breakfast in the classroom.** Some school food service directors said they started offering breakfast in the classroom to allow students more time to eat. With breakfast served in the classroom and students not required to take more than they wanted, the directors reported that there was very little waste from breakfast.

“If they’re eating breakfast in the classroom, I think it’s a more orderly start, and perhaps they can finish their meal better than when they’re in the school cafeteria eating breakfast and they’re being told to hurry.”

Challenge 3: Redistributing uneaten, intact items.

✓ **Offer sharing/trading tables.** A few school food service directors reported using sharing or trading tables to prevent foods from ending up in the trash. Students may place on such tables unopened, prepackaged foods



such as milk, or a food item such as a whole fruit that remains intact. Two directors said the school nurse checks the sharing table to ensure that foods placed there are suitable for sharing, and to collect any items that students have not picked up from the table. After washing any fruits, the nurse can make the remaining items available to students who missed breakfast or need a snack. One director said they collect and box up all of the uneaten packaged foods and fruits with peels, such as oranges and bananas. The boxes are placed outside for parents when they come to pick up their child after school.

Other school food service directors said they did not use sharing tables, in some cases because the local health department prohibits sharing tables due to concerns about disease transmission. Directors who did not use sharing tables also mentioned concerns about being able to monitor food safety, including possible risks to students with food allergies.

✓ **Donate intact items to food banks.** One school food service director said they regularly donate leftover food from the sharing table to the local food bank. Another director said they have donated foods from the sharing table occasionally, but said they do not do so regularly out of concern that kitchen staff might prepare extra food so there would be leftovers that can be donated.

TECHNICAL ASSISTANCE RECOMMENDATIONS

School food service directors in this study have used a variety of strategies to achieve success in minimizing plate waste for school meals. Their experiences and approaches provide relevant insights that can be applied in developing training and technical assistance materials. Such materials should focus on the following areas:

1. **Providing staff training:** Provide diverse, well-tested recipes that include a variety of flavors.
2. **Marketing to students:** Offer strategies for encouraging students to eat school meals and reduce plate waste.
3. **Marketing to school personnel:** Offer strategies for addressing concerns of school administrators, staff, and teachers, including responses to frequently asked question, and encouraging school administrators, staff, and teachers to be positive role models by supporting the new meal patterns and eating meals with students.
4. **Redistributing intact foods:** Offer strategies for implementing sharing/trading tables and donating food to local community organizations such as food banks.

This research brief was produced by Westat under contract with the USDA Food and Nutrition Service.

USDA is an equal opportunity provider and employer.