

Plate Waste in School Nutrition Programs

*How Much Is There?
How Can We Reduce It?*



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School Meals Provided to Children

Current Nutrition Standards

Lunch

- n 1/3 of RDA for
 - n Calories
 - n Protein
 - n Vitamin A
 - n Vitamin C
 - n Iron
 - n Calcium

Breakfast

- n 1/4 of RDA for
 - n Calories
 - n Protein
 - n Vitamin A
 - n Vitamin C
 - n Iron
 - n Calcium



It's Served, *But* Is It Eaten?

- n Plate waste = the amount of edible food served to students that is uneaten.
- n Common methods
 - n Physical measurement (weighing)
 - n Visual estimation
 - n Food recall
 - n Photography

Why Does Plate Waste Matter?

- n Given diversity of students, and day-to-day variation in appetite, some plate waste is inevitable
- But, excessive plate waste*
 - n May indicate inefficiency, unnecessary costs
 - n May indicate lack of customer satisfaction

***Most Important:* Plate Waste Must Be Considered As Part Of Meal Planning Process**

- n Affects likelihood of meeting nutrition goals
- n If goal is consumption of appropriate amounts, must consider how much of what is served is actually consumed
- n Can we minimize problem by encouraging consumption of underconsumed healthful foods?

Estimates of Plate Waste

- n How much plate waste can we expect? ***And***
- n Is it equally distributed across all foods (and nutrients) offered?
- n How does waste vary across students?

National estimates of Waste from NSLP Meals Were Last Obtained as Part of the School Nutrition Dietary Assessment Study-I (SNDA-I), SY 1991-92 Data

Percent of Wasted Energy and Nutrients, NSLP Lunches, All Students

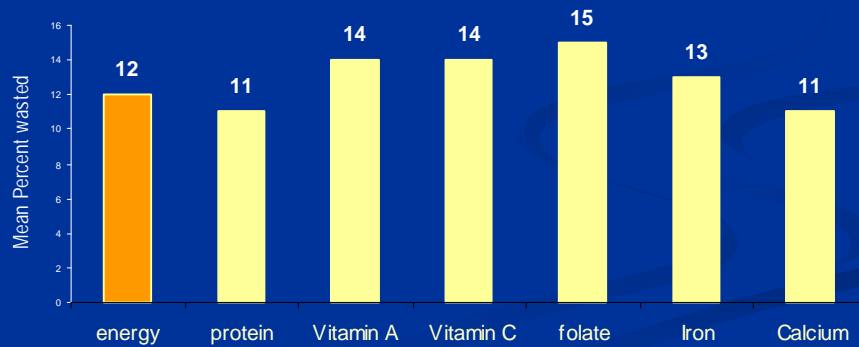
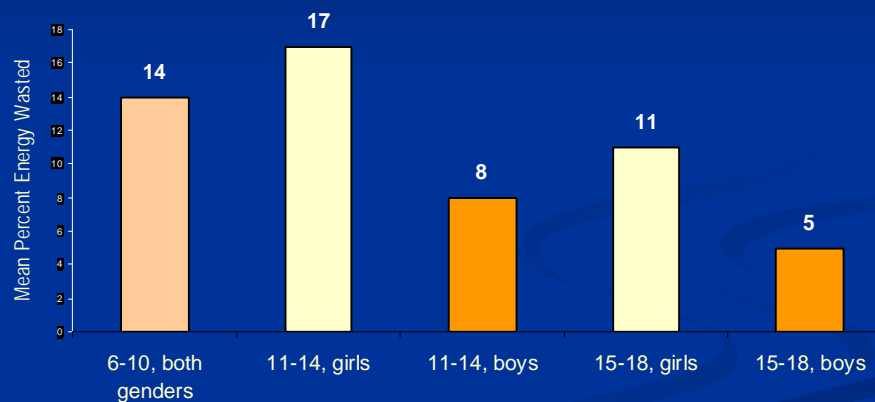


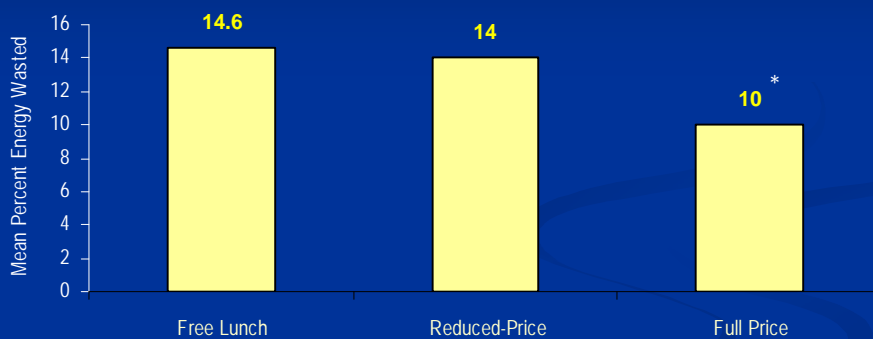
Plate Waste Varied by Age and Gender

Percent of Energy from NSLP Lunches Wasted, by Age and Gender



Source: SNDA-I, SY 1991-92 Data

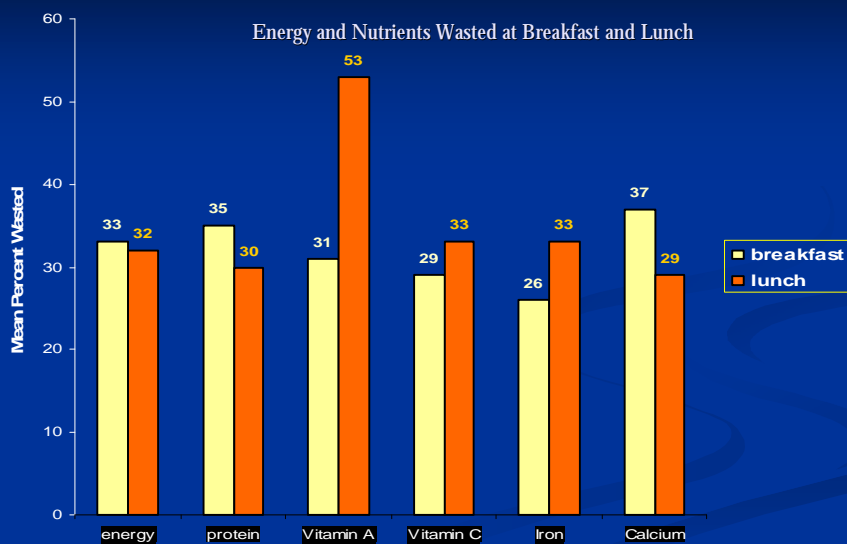
Students Receiving Free Lunch Wasted More Food than Those Receiving Full-Price Lunch



* Significantly different from "free lunch" at $p < .05$

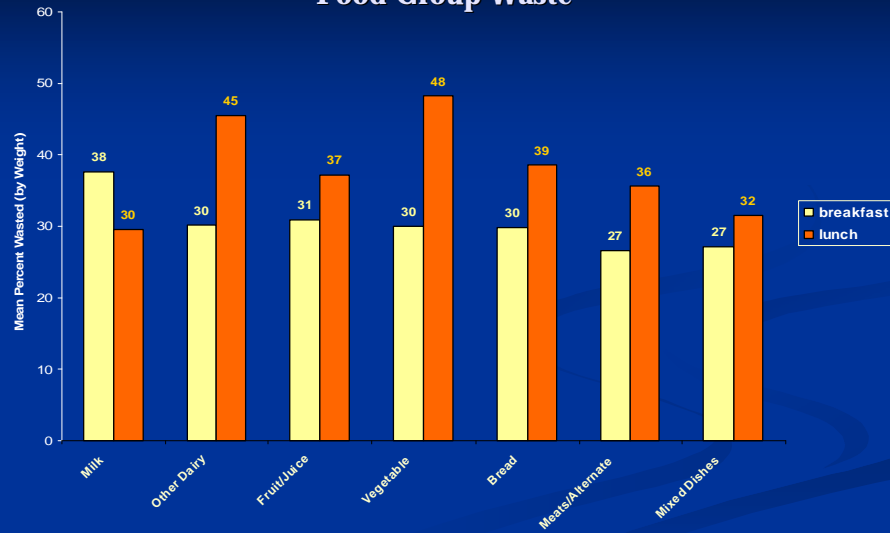
Source: SNDA-I data as analyzed by U.S. GAO; GAO/RCED-96-128R; May 8, 1996.

More Recent National Plate Waste Data from the Summer Food Service Program Evaluation Yielded Higher Waste Estimates



Source: Feeding Low-Income Children When School Is Out—The Summer Food Service Program. A. Gordon, R. Briefel. FANRR-30, Economic Research Service, 2003.

Plate Waste in the Summer Food Service Program Food Group Waste



Source: Feeding Low-Income Children When School Is Out—The Summer Food Service Program. A. Gordon, R. Briefel. FANRR-30, Economic Research Service, 2003.

Operational Factors Influence Plate Waste and Offer Potential Strategies for Reduction

- n “Offer vs. Serve” Option
 - n SNDA-I analysis found “offer vs. serve” reduced waste significantly without significant reduction in nutrient intakes



- n Regulations allow tailoring of portion sizes for age groups. But no data on effects of tailored portion sizes.

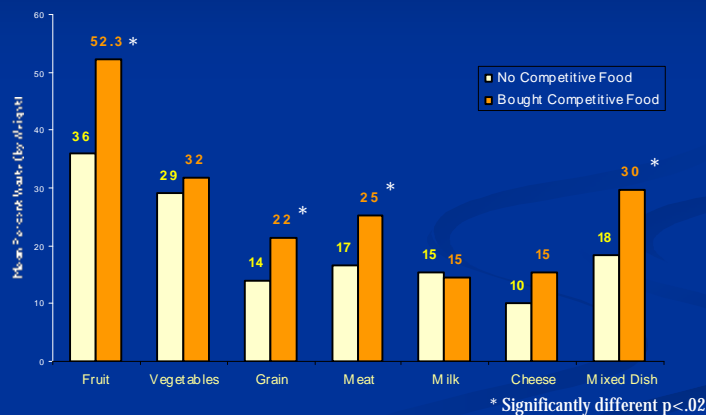
Findings from Smaller Studies

Meal Scheduling Can Influence Plate Waste

- n **Recess before Lunch**
 - n Consistently associated with better food consumption, less waste
 - n Nevertheless CDC data indicate recess scheduled before lunch in only 10% of elementary schools
- n **Timing of Lunch**
 - n Bergman et al. found student ate more and wasted less when served lunch at 12:30, compared to 11:30

Findings from Smaller Studies

Purchasing Competitive Foods Associated with Increased NSLP Waste



Source: Marlette et al., Food type, food preparation, and competitive food purchases impact school lunch plate waste by sixth-grade students. J. Am. Diet. Assoc., 2005



Findings from Smaller Studies

Strategies to Encourage Consumption of Healthful Underconsumed Foods, Decrease Plate Waste

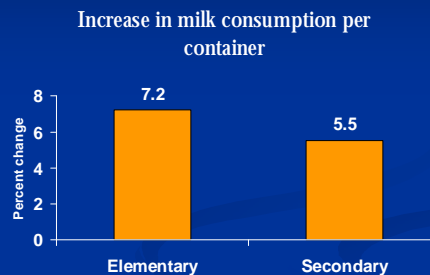
- n Offering More Choices Can Reduce Fruit and Vegetable Waste
- n Salad Bars May Help
 - n Possibly by expanding choices or allowing tailoring of portion sizes
- n “Easy-to-Eat” Options May Help



Findings from Smaller Studies

Marketing Changes Can Reduce Waste

- n Pilot milk marketing study added flavored milk, changed packaging, improved cold storage
- n Sales increased, waste decreased



Significant increase at 95% confidence level

Source: Prentice, Grant. “Marketing” School Milk to Children: A Review of Key Findings from the School Milk Pilot Test. presented at the Healthy Schools Summit October 8, 2002.



Findings from Smaller Studies *A Simple Prompt Can Encourage Consumption*

Asking “*Would you like fruit or juice with your lunch?*” increased the number of children selecting fruit or juice with their meal from 60% to 90%. Plate waste data indicated that children in the “prompted” groups did not waste more than children in the “unprompted” groups.

Source: Schwarz, MB. The influence of a verbal prompt on school lunch fruit consumption: A pilot study. *Inter. J. Behav. Nutr. And Phys. Activity.* March 5, 2007.



Findings from Smaller Studies *Linking Classroom and Cafeteria Can Be Effective*

The CookShop Program increased consumption of dark-green and deep-yellow vegetables and whole grains and decreased plate waste through pairing cooking and tasting experiences in the classroom with cafeteria offerings of these foods.

Source: Liquori, et al. The Cookshop Program: Outcome evaluation of a nutrition education program linking lunchroom food experiences with classroom cooking experiences; *J. Nutr. Educ.* 30 (5):302-313, 1998.

Conclusions

- n Research on plate waste in school meals and the factors that influence it is limited, making it difficult to draw firm conclusions.
- n The best available national estimate of plate waste in the NSLP remains the SNDA-I estimate of 12 percent of energy, but given program changes since SNDA-I, the accuracy of the number is questionable.
- n Age and gender influence plate waste. Planning strategies may need to consider this.
- n Operational strategies have potential to reduce plate waste and encourage consumption of healthful, underconsumed foods.

Sources:

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- Kerfoot, BA and Fournet, RM. Evaluation of the use of a self-service fruit and vegetable bar on the consumption and plate waste. *J. Am. Diet. Assoc.* 96(9):A-10, 1996.
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