Mission Possible: Kids Will Eat School Meals

An Overview of Dietary Assessment Methods

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Have the new school meal regulations resulted in increased food waste?

Popular Media: Yes

Research: Yes and No
How do we know what children eat at school?

**Dietary Assessments Using Children’s Self-Reported Intake**
- Dependent on memory and cognitive abilities
- Portion sizes may be difficult to estimate

**Dietary Assessments Using Meal Observations**
- Collects information on food selection and plate waste
- Objective measure independent of self-reporting errors
Dietary Assessment Methods

- **Weighed Plate Waste**
  - Individual
  - Aggregate

- **Direct Observation**
  - 5-6 point Scales

- **Digital Imaging**
  - Selection And Waste
  - Combined with Observation
**Weighed Plate Waste Methods**

### Individual

- **Salad Bar evaluation** (Adams, JADA 2005)
- **Program evaluation** (Cohen, JAMA Ped 2015)
  - Label Student Trays
  - Establish baseline weights (5-10 random samples)
  - Observe/count/weigh student selections
  - Collect trays and weigh remaining food

\[ S - W = \text{Consumption} \]

\[ S = \text{weight of selected food(s)} \]

\[ W = \text{weight of student waste} \]

### Aggregate

- **Gamification increases fruit & vegetable consumption** (Jones, Prev Med 2014).

\[ \frac{P - U - W}{N} = \text{Consumption} \]

\[ P = \text{weight of prepared food(s)}^* \]

\[ U = \text{weight of unserved food(s)}^* \]

\[ W = \text{weight of student waste} \]

\[ N = \text{number of students} \]

*Relies on *Production records*
Direct Observation Methods

- New school meals in Los Angeles (Gase, Prev Med 2014)
- Home Packed vs School Lunches (Farris, JNEB 2014)
- Fruit/Vegetable Selection & Consumption (Cullen, J Acad Nutr Diet 2015)

- Comstock’s 6-point scale (J Am Diet Assoc 1981)
  None, Taste (10%), Some (¼), Half (½), Most (¾), All

- 5-point Scale (Hanks, J Acad Nutr Diet 2014)
  None, ¼, ½, ¾, All

- Observer training and reliability testing
Digital Imaging Method

- Determination of average serving weights of FV
  - FV selection image
  - FV plate waste image
    - Percentage consumed estimated using a five or six-point scale

- Farm to School Program evaluation (Yoder, JNEB 2014)

- Foods brought from home (Hubbard, J Acad Nutr Diet 2014)

- New School Meal Regulations (Schwartz, Childhood Obes 2015)

- Program Evaluation (Shaping Healthy Choices) (Scherr, JNEB 2014)
Utilizing School-Based Volunteers for Digital Imaging Data Collection

- Compared DI data collected and transmitted by parents and teachers to the UVM research team.

- Teachers may be better at collecting DI dietary assessment data than parent volunteers and university researchers.

<table>
<thead>
<tr>
<th>Feasibility of Collecting Digital Image Pairs in Two Elementary School Cafeterias (Grades 3-5)</th>
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<tbody>
<tr>
<td><strong>Lanyards distributed to students</strong></td>
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<tr>
<td>-------------------------------------</td>
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<tr>
<td>320</td>
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<tr>
<td><strong>Percent DI pairs</strong></td>
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WPW: Children’s Milk Consumption

- 10 elementary schools (7 northeast, 3 south)
- Individual WPW (grades 3-5)
- Overall, no change in flavored milk consumption.
- Differences between and within schools (SES, grade, sex, milk packaging).

2010: 150-170 calories, 0-1% fat, 22-27gm total sugars
2013: 110-130 calories, 0% fat, 18-22 gm total sugars
Selection

- More lunch trays contained fruits or vegetables, in larger amounts (fruit)
- Fewer children selected both fruits and vegetables

Consumption

- FV consumption decreased 12%
- FV waste increased 56% (mostly fruit)
Digital Imaging
Farm to School/Non-Farm to School

Farm to School

Non-Farm to School

Optional 2011/12 (n=258 trays)
Required 2012/13 (n=402 trays)

Optional 2011/12 (n=240 trays)
Required 2012/13 (n=542 trays)
Opportunities – Universal Recycling/Composting

- Aggregate WPW Method simplified

- Food scrap weights can be compared to:
  - Menu/Entrée selection
  - Pre/Post Intervention
Next Steps

- Objective dietary assessment methods can evaluate menu changes, educational programming, cafeteria environment.

- Digital Imaging methods continue to evolve.

- What role does the Cafeteria Environment play?
  - Amount of time in service line/at table
  - Increases in fruit or vegetable selection may be a result of:
    - greater variety
    - placement at register/POS
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