P13 (continued)

All studies reported improvement in at least one of the dietary behaviors. Elements associated with larger improvements in outcomes across countries and programs were: using a behavior change framework, using multiple frameworks, active community participation during design and implementation of intervention, and uniform messaging from school members and parents.

Conclusions and Implications: The evidence supports that efficacious elementary school-based interventions to reduce obesity included several behavior change frameworks and the active participation of stakeholders. Further research needs to examine the optimal combination of frameworks and specific elements that result in improved outcomes.

Funding: None

P14 Comparison of School Lunch Cut Fruit and Whole Fruit Consumption in a Naturalistic Elementary School Cafeteria Setting

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Objective: School lunch programs seek strategies to increase student' fruit consumption. This study compares 2nd and 3rd grade students' consumption of cut versus whole fruit during school lunch.

Design, Setting, Participants, and Intervention: Second and 3rd grade students from 14 New York City public elementary schools were observed on at least 3 days during lunch. On observation days, 3–6 researchers observed 4 random students each, using the System of Observational Cafeteria Assessment of Foods Eaten (SOCAFE).

Outcome Measures and Analysis: Fruit selection was recorded, as was amount consumed (0%, 10%/bite, 25%, 50%, 75%, 100%, >100%). Apples and pears were served both as cut and whole. Univariate ANOVA tested for mean differences between cut and whole fruit, and 2nd and 3rd graders.

Results: Overall, cut fruit was consumed significantly more than whole fruit (62%, SD=49% versus 33%, SD=41%, $p<0.001$). Specifically 64% (sd=49%) of sliced apples were consumed versus 36% (sd=41%) whole. Data were similar for pears, 52% (sd=50%) chopped versus 27% (sd=40%) whole. Differences were significant for both fruits ($p<0.01$). Apple type and grade had a significant interaction with 3rd graders eating more than 2nd graders for sliced apples (80%, sd=46% vs. 48%, sd=47%, $p<0.01$). There were no significant interaction of pear type and grade.

Conclusions and Implications: Students ate more fruit when it was served cut versus when it was served whole. This confirms previous research on cut versus whole apples. School lunch programs hoping to increase fruit consumption in younger elementary school children could try serving cut fruit more often.

Funding: Wellness In The Schools

P15 Another Partner in the Classroom: The Role of Nutrition Education in the Implementation of School Nutrition Policies

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Objective: In recent years, the United States Department of Agriculture (USDA) has addressed school food environment reform with updated nutrition standards for school meals and snacks. There is limited literature informing best practices for successful implementation of such policies. This study examined policy implementation through the experiences of food service directors (FSDs) and high school students.

Design, Setting, and Participants: We conducted qualitative key informant interviews with FSDs ($n=9$) from 8 states and focus groups with high school students ($n=15$) from 10 states across the US. All data collection instruments focused on experiences and perceptions of school meal and snack policy implementation.

Outcome Measures and Analysis: Interview and focus group transcripts were coded in Atlas.ti v7 qualitative software. Two analysts coded and conducted constant comparative analysis and case comparisons following Miles, Huberman & Saldaña (2014). Principles of Lincoln & Guba's (1985) trustworthiness were incorporated to enhance rigor of findings.

Results: Both FSDs and students reported the importance of nutrition education (NE) in facilitating implementation of school food and nutrition policies. NE was described as including classroom instruction and nutrition activities such as taste testing, Harvest of the Month, and school gardens. NE was critical in facilitating buy-in and awareness amongst students, changing social norms, and communicating policy intentions.

Conclusions and Implications: Consistent with literature noting the importance of a comprehensive wellness approach, these findings indicate that NE was perceived as playing a critical role by stakeholders. The findings are especially relevant given the pending release of the local wellness policy rule, which includes nutrition education goals.

Funding: USDA

P16 Effectiveness of the National School Lunch Program on Fruits and Vegetables Intake Among High School Students

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Continued on page S15

P16 (continued)

Objective: In 2012, improved nutrition standards of the National School Lunch Program (NSLP), was implemented by the United States Department of Agriculture (USDA) as part of the Hunger Free Kids Act of 2010. Increasing children's fruits and vegetables (FV) consumption is an important goal of the USDA. This study aims to determine whether the implementation of the updated NSLP has any impact on the FV intake among high school students.

Design, Setting, Participants, and Intervention: Data from the 2009, 2011, and 2013 national Youth Risk Behavior Surveys (YRBS) were analyzed. The surveys used a three-stage cluster sample design to obtain nationally representative samples of high school students.

Outcome Measures and Analysis: Selected items from the YRBS surveys included FV consumption, and demographic variables. Two questions were used to elicit fruit intake and 4 questions assessed vegetable intake. Data were analyzed with SAS 9.4. using descriptive statistics and ANOVA.

Results: Mean scores (times/day) for fruit intake were significantly different from 2011 (1.84 ± 1.84) to 2013 (4.36 ± 2.25) ($p < 0.05$), but not from 2009 (1.84 ± 1.81) to 2011. A significant increase in fruit intake was noted among both genders and ethnic groups from 2011 to 2013. There was no meaningful difference in vegetable intake from 2009 (1.74 ± 1.98) to 2011 (1.82 ± 2.18), and from 2011 to 2013 (1.81 ± 2.12).

Conclusions and Implications: The updated NSLP may have influenced an increase in fruit intake, but not in vegetable consumption. School nutrition education efforts should be focused on the promotion of vegetable consumption.

Funding: None

P17 Better Bundled: Combined Vegetable Side and Main Dish Items Increase Vegetable Consumption Among Elementary and Middle School Students

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Objective: To determine if combining vegetable side dish items with main dish items (bundling) increases vegetable consumption among elementary and middle school students.

Design, Setting, Participants, and Intervention: In a quasi-experimental design, demographically matched pairs of elementary (grades 3-5) and middle (grades 6-8) schools with >50% free and reduced lunch enrollment were randomized to control and intervention within pair. The Quarter-Waste method was used to estimate vegetable consumption six times at each school: baseline, intervention, and follow-up for two combinations (broccoli and teriyaki chicken; lettuce/tomato cups and tacos). During baseline, all schools served vegetables as optional side items. During intervention (three weeks post base-

line), control schools served all items identically to baseline, while intervention schools served bundled meals where broccoli was mixed with teriyaki chicken and lettuce/tomato was served on tacos. Follow-up assessments were conducted at all schools and meals were served identically to baseline.

Outcome Measures and Analysis: Main outcomes were vegetable selection assessed by visual counts at point of sale and vegetable consumption. T-test of proportions analysis was conducted to determine outcomes.

Results: Bundling meals increased vegetable selection in intervention schools by 250%. Bundling significantly increased vegetable consumption in intervention schools compared to baseline ($p = .0003$) and compared to controls ($p = .015$).

Conclusions and Implications: Policies mandating reimbursable meals include at least one fruit or vegetable item have successfully increased the number of fruits and vegetables served in school meals; however, increasing consumption and reducing waste remains a concern. Bundling vegetables with suitable main dish items is an effective and inexpensive means of increasing consumption with little impact on waste or cost.

Funding: Cornell BEN Center

P18 Is Your Child's Lunchroom Smart? Assessing the Reliability of a Scorecard Approach for Rating School Lunchrooms

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Objective: How reliable is a scorecard approach for rating whether a school lunchroom is helping to make kids healthy or make them heavy. In 2013, the Smarter Lunchroom approach widely released a 100-point scorecard of suggested, research-based behavioral changes that would make it easier for kids to make healthier choices. This research examines which changes schools found easiest to make and if such a scorecard could be reliably used to rate a school lunchroom's effectiveness in making these changes.

Design, Setting, Participants, and Intervention: First, eight untrained coders used both an abbreviated scorecard and a 100-point scorecard to score three schools. Second, a national sample of 8243 Food Service Directors were contacted and asked to self-scored their lunchroom using the abbreviated scorecard.

Outcome Measures and Analysis: Inner-rater reliability and the adoption incidence of different changes across a wide variety of schools.

Results: In pilot tests, inner-rater reliability was respectably high. The survey of the Food Service Directors confirmed that these implementation of changes varied across schools ($p < .0010$) with high schools being the most variable. The biggest predictor of the awareness of the scorecard was highly related to whether a food service director is a member of organizations such as School Nutrition Association, Society for Nutrition Education and

Continued on page S16