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(FMI) integrated nutrition education program among 4th grade students, as compared to a similar group of control students.

**Study Design, Settings, Participants, Intervention:** The sample consisted of  $n=263$  students nested in 18 classrooms in North Carolina and Ohio. Nine classrooms used FMI and nine used traditional mathematics and science curriculum in a quasi-experimental design.

**Outcome Measures and Analysis:** Multi-level models were used to assess the relationship between student-level variables including: gender, free and reduced lunch status (as a proxy for student socioeconomic status), and baseline nutrition knowledge; classroom-level variables including: control or intervention status, teacher experience and teacher nutrition training on student nutrition knowledge at the conclusion of the program. A total of five models were built and analyzed using PROC MIXED and estimated using maximum likelihood in SASv9.4.

**Conclusions and Implications:** Classroom-level variables including curriculum and teacher characteristics accounted for ~56% of variability in nutrition knowledge after the program. The FoodMASTER intervention was found to be a significant predictor of nutrition knowledge. Students exposed to FMI score on average 4.32 points higher than control classrooms ( $p=.0001$ ). Teachers with 8+ years of experience were found to improve predicted post-nutrition knowledge scores ( $p=.006$ ). Based on these analyses, integrated nutrition education such as FoodMASTER significantly increases student nutrition knowledge. Further, there is a moderating influence of teacher experience indicating that effectiveness of nutrition education programs may be improved when administered by experienced teachers.

**Funding:** None

## P7 Clustering of Youth Empowerment and Health Behaviors Among Sixth to Eighth Grade Adolescents

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**Objective:** To identify clusters of perceived youth empowerment among sixth to eighth grade adolescents and their cross-sectional associations with demographic indicators; to examine the distribution of health behaviors (including nutrition and physical activity (PA) behaviors), as identified clusters, among genders.

**Study Design, Settings, Participants, Intervention:** This baseline study was conducted as part of a five-year tri-state community-based participatory research (CBPR) project-Ignite: Sparking Youth to Create Healthy Commu-

nities. A total of 282 six to eighth grade adolescents from South Dakota, Kansas and Ohio completed questionnaires related to youth health behaviors and perceived youth empowerment.

**Outcome Measures and Analysis:** The cluster analysis identified groups of adolescents with similar perceived youth empowerment. Chi-square tests assessed cluster differences by gender, ethnicity, and urban/rural status. Analyses were conducted using SAS 9.4 software.

**Results:** Two clusters were identified empowered youth (EY) ( $n=90$ ) and “un-empowered youth (UY)” ( $n=192$ ). For both genders, the “EY” cluster had significantly greater ( $P < 0.05$ ) health promoting behaviors which included greater self-efficacy, motivation, perceived social support in regards to healthy behaviors, positive health beliefs and less perceived barriers to healthy eating and PA when compared to UY. In addition, the youth in the EY cluster reported more time for PA (total at least 60 minutes/day) per week.

**Conclusions and Implications:** Promoting youth empowerment may be an effective way of informing interventions designed to foster engagement in health-promoting behaviors among adolescents. Further research should investigate the influence for youth empowerment to promote the health development in youth and create greater community change.

**Funding:** NIFA

## P8 Cognitive Interviews Define Fuel for Fun Physical Activity Survey Items as Face Valid with Rochester, NY Area Fourth Graders

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**Objective:** Assess face validity of tested physical activity (PA) self-report items used to evaluate Fuel for Fun with a new 4th grade audience.

**Study Design, Setting, Participants:** Face-to-face, audio-recorded cognitive interviews conducted at library or school venues with a convenience sample of children from the Rochester, NY area.

**Outcome Measures and Analysis:** Interview transcripts were analyzed with Atlas.ti using a content analysis approach. Coherence and congruence with reference definitions were assessed for descriptions or amount of strenuous, moderate, mild, sedentary activity and practices/intentions toward PA to denote stage of change for PA behavior.

**Results:** Students ( $n=24$ ; 50% girls; 92% white; 12% Hispanic) ranged from 8 to 10 y ( $M=9.70\pm.43$  y) and attended nine schools (three urban, six suburban). Four students attended schools with free/reduced lunch participation  $\geq 50\%$  of the student body. Mean interview length was  $29\pm 4$  min. Stage of change was action/maintenance for 87%, with  $172\pm 110$  min/week strenuous activity,  $155\pm 122$  min/week moderate,  $124\pm 136$  min/week mild, and  $2.5\pm 2.2$  hours/day sedentary activity. Although only 17% demonstrated comprehension of the terms strenuous,

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moderate or mild without example activities, all students reported that the listed example activities aided comprehension. Chronological understanding was strong with 96% providing sound responses for the difference between 30 and 60 minutes and 78% for the difference between 30 days and 6 months. The mixed horizontal-vertical layout was navigated well by 92%.

**Conclusions and Implications:** Fuel for Fun PA items demonstrated face validity and utility to assess PA interventions with 4th grade youth. However, comprehension may be improved further by simplifying specific terms and changing layout to a vertical-only format.

**Funding:** USDA, Rochester Institute of Technology

### P9 Consumption of Snacks and Carbonated Beverages are Higher in ADHD Korean Children Aged 7-10 Years

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**Objective:** Attention-Deficit Hyperactivity Disorder (ADHD) is common in children. But little is known about the dietary behaviors of Korean children with ADHD. The objective was to examine whether the number of snacks, type of snack, and attitude of mothers was associated with dietary behaviors of children with ADHD.

**Methods:** A total of 223 school children aged 7-10 years-old and their mothers were enrolled in Daegu City, Korea. Parents completed a socioeconomic status and were asked questions, such as frequency of children's snacking, kinds of snack, reasons for snacks, and preparation of snack. Teachers were informed of the study and requested to cooperate. The children were screened ADHD by using Korean ADHD Rating Scale by their school teachers.

**Outcome Measures and Analysis:** Data were analyzed using SAS version 9.3 (SAS Institute, Inc.). Significant differences were defined as  $p < 0.05$ . Student's t-test were used to determine significant differences between groups.

**Results:** Both the control and ADHD group were all snacking. Education levels were low, and employment level is high. Mothers of the ADHD group are more likely to provide snacks to children based on children's preference for food, such as carbonated beverage, processed food, and confectionery, compared to the mothers of the control group.

**Conclusion:** The present study revealed increased consumption of confectionery snacks and carbonated beverages in ADHD children.

**Funding:** None

### P10 Differences in Overall Diet Quality in US Children Who Consumed or Skipped Breakfast by Weight Status

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**Objective:** Breakfast consumption has been linked to numerous positive effects in children related to improved dietary quality and obesity prevention. The purpose of this study was to assess differences in dietary patterns between children who consumed breakfast versus those that do not by weight status.

**Study Design, Setting, Participants:** Dietary intakes of 13- to 18-year-old children ( $n=4,110$ ) from the 2005-2012 National Health and Nutrition Examination Survey and were categorized by breakfast consumption.

**Outcome Measures and Analysis:** Dietary intakes were assessed using a 24-hour recall. Breakfast consumption was tallied using self-reported meal identification for foods reported. Diet quality was tabulated using the Healthy Eating Index-2010 score (HEI-2010, 0-100 range). Children's weight status was categorized using BMI-for-age percentiles into normal weight, overweight, and obese classifications.

**Results:** Approximately 72% ( $n=2,870$ ) of children ate breakfast on the day of report. Normal weight children were more likely to eat breakfast (74%) than overweight and obese children (66%, respectively) on the day of intake. Total diet quality was better in children who ate breakfast (HEI-2010: 42.1-43.0) than those who skipped breakfast (HEI-2010: 37.8-39.5) with little differences in HEI-2010 noted by weight status. Children who ate breakfast had better diet quality scores for fruit, whole fruit, whole grains, dairy products, and empty calories, but had lower scores for vegetables, protein foods, fatty acids, and refined grains.

**Conclusions and Implications:** Overall diet quality was better in children who ate breakfast than those that did not, regardless of weight status. Breakfast consumption is related to better dietary patterns and further research is needed to explore the drivers of the intakes that create those differences.

**Funding:** None

### P11 Eat Smart in Parks: Impacts of a Youth Photovoice Project

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**Objective:** Interest in healthy food and beverage options in parks, recreation centers and public spaces is growing. As part of Eat Smart in Parks (ESIP)—a nutrition environment initiative named a promising practice by SNAP-Ed—a youth photovoice engagement project launched in 2015 to help address the nutrition issues and needs identified by youth in Missouri. This study examined if participating in this photovoice project changed youth's perceptions regarding parks and healthy food environments.

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