Easy as ABC, 123:
Integrating Nutrition and Activity in Early Childhood
Learning to Build Lifelong Healthy Habits

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Why Preschoolers?

• 26% considered either overweight or obese
  – Low-income, minority, rural families disproportionately affected
• Not meeting nutritional or physical activity guidelines
• Critical window for obesity prevention efforts
  – Development
Program Goal: Increase children’s willingness to try new foods

Program Goal: Enhance gross motor performance

Bellows, Davies, Anderson, Kennedy. (2013) *Amer J Occupational Therapy:*67(1); 28-36
Fun With New Foods
- Increase Willingness to Try New Foods

Mighty Moves
- Increase Gross Motor Skills

Improve Self Competence

Dietary Intake
Physical Activity

Establish Healthy Habits to Prevent Future Weight Gain
Longitudinal Eating And Physical Activity Study

Goal: To Assess if the Effectiveness of a Preschool Nutrition and Physical Activity Program is Sustained in Early Elementary School
Study Design
3 Cohorts

<table>
<thead>
<tr>
<th>Grade</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>Kindergarten</td>
<td>1st Grade</td>
<td></td>
</tr>
<tr>
<td><strong>The Food Friends Intervention</strong></td>
<td><strong>Assessment Period</strong></td>
<td><strong>Assessment Period</strong></td>
<td></td>
</tr>
<tr>
<td><em>Fun with New Foods (12 weeks) &amp; Get Movin with Mighty Moves (18 weeks)</em></td>
<td><strong>Baseline (Time 1; Fall) Post-Intervention (Time 2; Spring)</strong></td>
<td><strong>1 year Follow-up (Time 3; Spring)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Super Taster and Mighty Mover - School (5 monthly units)</strong></td>
<td><strong>1 year Follow-up (Time 3; Spring)</strong></td>
<td><strong>2 year Follow-up (Time 4; Spring)</strong></td>
<td></td>
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</tbody>
</table>
School-based Intervention

Treatment schools (n=2)

- **Food Friends** (12 wks) & **Mighty Moves** (18 wks) implemented in Pre-K
- Kindergarten and 1st grade ‘booster’ programming in classroom, cafeteria & school
Super Taster & Mighty Mover Club

• 1st Grade
• Monthly Direct Mail
  – Child Newsletter
  – Educational Enhancer
  – Parent Newsletter
• Reinforces/Promotes Super Taster & Mighty Mover messages

Dear Child’s name,
Hello, we are The Food Friends! We are here on a mission. A mission to help you become a Super Taster and Mighty Mover! Each of us has our own superpower that we use to try new foods. We also have a special mighty move that we get to use every day! This month you are going to learn about using your five senses. Then you are going to learn about new ways to move!

Sincerely,
The Food Friends

Family Fun Challenge: Breakfast Scramble
1. Find a small or medium box and take a good look at the front picture.
2. Get three sheets of newspaper and cut them into strips. Then crumple the strips.
3. Place the strips on the box and fill your own eggs in the box.
4. Put 1/4 teaspoon of bacon bits in the box and close it tightly.
5. Use your imagination to write a recipe for the scrambled egg.
## Participants by Cohort & Time

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Time 1 Fall Pre-K</th>
<th>Time 2 Spring Pre-K</th>
<th>Time 3 Spring K</th>
<th>Time 4 Spring 1st</th>
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</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
</tr>
<tr>
<td>Child</td>
<td>95</td>
<td>86 (91%)</td>
<td>74 (78%)</td>
<td>86 (91%)</td>
</tr>
<tr>
<td>Parent</td>
<td>79</td>
<td>83%</td>
<td>91%</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>55%</td>
<td>38</td>
</tr>
<tr>
<td>Parent</td>
<td></td>
<td></td>
<td></td>
<td>44%</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
</tr>
<tr>
<td>Child</td>
<td>119</td>
<td>113 (95%)</td>
<td>103 (87%)</td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>78</td>
<td>66%</td>
<td>64</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>57%</td>
<td>48%</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>Child</td>
<td>19</td>
<td>18 (95%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>16</td>
<td>84%</td>
<td>9</td>
<td>56%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child</td>
<td>233</td>
<td>217 (93%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>173</td>
<td>74%</td>
<td>151</td>
<td>70%</td>
</tr>
</tbody>
</table>
Participant Characteristics

Child

- Age: 55.8 (4.7) months
- Sex: 55% Female
- Ethnicity: 44% Hispanic
- BMIz: .5 (1.1)
- Weight Category:
  - Normal: 66.8%
  - Overweight: 15.9%
  - Obese: 14.4%

Family

- > 90% Mothers completed packet
- Education: 33% High School or less
- Income: 69% < 185% Poverty
Food Behaviors

Are they trying it? (baseline to time 2)
- 49% refused at least 1 food at baseline
  - Decreased to 23% in Intervention (I) & 33% in control (C)
- 63% used exploratory behaviors at baseline
  - Decreased to 31% (I) and 40% (C)
- Food Refusals are related to exploratory behaviors

“Just eat *something*”
The more neophobic a child is reported to be, the more a parent:
1) pressures the child to eat
2) has concern about their child not eating
3) employs restrictive feeding practices
Gross Motor Performance

- A significant group by time interaction was found for
  - Balance ($P=0.006$)
  - Running speed and agility ($P=0.017$)
  - Upper limb coordination approached significance ($P=0.077$).

- The intervention enhanced the rate of gross motor development, however children are still below norms for their age/sex at Time 2.

Note: No significant differences existed between groups at Time 1. Point scores for Balance Subtest range from 0 – 37 (mean of norming sample ~ 26). Higher scores reflect more advanced balance skills.
The availability of foods in the home is linked with child’s dietary intake (FFQ) of key foods—vegetables, fruit, whole grains.

- Fruits ($R^2 = .06, p<.01$)
- Vegetables ($R^2 = .04, p<.01$)
- Whole grains ($R^2 = .02, p<.05$)
- Sugar Sweetened Beverages ($R^2 = .31, p=.01$)
Potential Impact

• More evidence of longitudinal relationships among children’s weight status and
  – children’s food preference and food consumption &
  – motor performance and physical activity
  – the influence of the home environment

• Examine children’s eating and activity habits from an ecological perspective

• Result in specific recommendations for obesity prevention interventions among young children
Future Directions

- Address multiple audiences
- Address multiple settings
- Develop messages & strategies that resonate with parents
- Capture & build on Pester Power
- Develop/Improve measurement instruments
- Train next generation of EC teachers & providers
- Balance policy with practicality
Current LEAP Research Team

Colorado State University

Laura Bellows (PI)
Patti Davies (Co-PI)
Bill Gavin (Co-I)
Jennifer Anderson (Co-PI)

CSU & CU Staff, Students and Interns

University of Colorado

Susan Johnson (Site-PI)
Richard Boles (Co-I)

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Opportunities & Environments

Questions??