Whole Grain Meals for Schools

Grains for Health Foundation
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Whole Grain Forum
Beijing, China
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Points of Interest

- Public Health & Nutrition Landscape
- Grains as a Vehicle to Improve Nutrition in the Food Supply
- A Challenge to the Grains Community
- YOU are the Solution
Obesity in Children - USA

Figure 1. Trends in obesity among children and adolescents: United States, 1963–2008

NOTE: Obesity is defined as body mass index (BMI) greater than or equal to sex- and age-specific 95th percentile from the 2000 CDC Growth Charts.


Source: http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/Figures1.png
Americans Do Not Meet Federal Dietary Recommendations

- NHANES 2001-2004 dietary data
- 24-hr recalls 16,338 persons, aged 2 and older
- Translated into MyPyramid Equivalents
- Nearly the entire US pop consumes a diet that does NOT meet dietary guidance

Americans Do Not Meet Federal Dietary Recommendations

- The US food supply provides:
  - Too much solid fats, added sugars, and sodium
  - Not enough fruits, vegetables, whole grains and milk
  - “Pervasive overconsumption” of these energy sources

- Leading to unnecessary consumption of empty calories

Figure B2.2. Dietary intakes in comparison to recommended intake levels or limits

Eat more of these:
- Whole grains: 15% vs. 59%
- Vegetables: 42% vs. 59%
- Fruits: 52% vs. 59%
- Milk: 61% vs. 59%
- Oils: 40% vs. 59%
- Fiber: 40% vs. 59%
- Potassium: 56% vs. 59%
- Vitamin D: 42% vs. 59%
- Calcium: 75% vs. 59%

Eat less of these:
- Calories from SoFAS: 280% vs. limit
- Added sugars: 242% vs. limit
- Solid fats: 281% vs. limit
- Refined grains: 200% vs. limit
- Sodium: 229% vs. limit
- Saturated fat: 158% vs. limit

Intake as percent of goal or limit

Note: Bars show average intakes for all individuals (ages 1 or 2 years or older) as a percent of the recommended intake level or limit. Recommended intakes for food groups and limits for refined grains, SoFAS, solid fats, and added sugars are based on the USDA 2000-calorie food patterns. Recommended intakes for fiber, potassium, vitamin D, and calcium are based on the highest AI for ages 14 to 70 years. Limits for sodium are based on the AI and for saturated fat on 7 percent of calories.

Issue: Healthy Grain-based Food in Schools

- Grain-based entrees contributing to excess sodium and fat (Clark, et al., 2009)
- Low (Insufficient) levels of whole grain and fiber
- Grain-based deserts contributing to low-nutrient, energy dense (LNED) food overconsumption in public schools (Briefel, et al., 2009)
Grains as a Vehicle to Health

- Small changes in grain-based food ingredients = big opportunity to meet dietary guidance
  - Whole grain & fiber
  - Fruit & vegetable add-ons
  - Sugar, salt, and fats
  - Portion size / caloric density
Gradually introduce partial whole grains
- Similar to the gradual transition from whole milk to skim milk
- Develop partial whole grain products with lower levels of whole grain flour
  - Pizza, bread, rolls, crackers, cookies

Repeated exposures
- Acceptance of new foods may increase upon repeated exposures (Birch et al., 1998)
- Combining familiar and unfamiliar elements (Urbick, 2002)
Study Site: School Cafeteria

- **Study Design**
  - RW pizza crust was offered 2 times
  - The 50:50 blend pizza crust was offered 4 times
  - Both types of pizza were made with a cheese topping, and served with a veg / salad

(Chan, et. al, 2008)
Plate Waste Procedure

- Grain products offered on the serving line
- Weigh 10 samples of grain product to determine mean weight
- Children discard unfinished grain products into plate waste container
- Waste is weighed

(Chan, et. al, 2008)
Pizza Products

**Refined Wheat**

- 100% refined red wheat flour

**50:50 Blend**

- 50% white whole wheat flour *
- 50% refined wheat flour

16 g whole grain = 1 serving

*(Chan, et. al, 2008)*

*Ultragrain, ConAgra Foods, Omaha, NE*
• Percent Consumption was determined from plate waste in grade schools.

• Pizza crust made with white or red whole wheat was just as acceptable as traditional crust from refined flour.

(Chan, et. al, 2008)
**Consumption of Partial and 100% Whole Grain Foods by Elementary School Children**

<table>
<thead>
<tr>
<th>Grain Products Served (per serving)</th>
<th>Average Number of Children (N)</th>
<th>Percent of Grain Ingredient as WG</th>
<th>Amount of WG (grams per serving)</th>
<th>Consumption Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger bun (2 oz) 16</td>
<td>320</td>
<td>0 - 91</td>
<td>0 - 25</td>
<td>63%</td>
</tr>
<tr>
<td>Pizza (1 slice†) 6, 20</td>
<td>290</td>
<td>50</td>
<td>8 - 16</td>
<td>74%</td>
</tr>
<tr>
<td>Pasta (1/2 cup) *</td>
<td>340</td>
<td>23 - 100</td>
<td>6 - 25</td>
<td>73%</td>
</tr>
<tr>
<td>Rolls (1.5 oz) 16</td>
<td>360</td>
<td>0 - 91</td>
<td>0 - 19</td>
<td>68%</td>
</tr>
<tr>
<td>French bread (1 oz) 20</td>
<td>345</td>
<td>50</td>
<td>6</td>
<td>45%</td>
</tr>
<tr>
<td>Crackers (30 g) 17, 18</td>
<td>115</td>
<td>0 - 100</td>
<td>0 – 26</td>
<td>71%</td>
</tr>
<tr>
<td>Cookie (30 g) *</td>
<td>275</td>
<td>75 - 100</td>
<td>5 – 10</td>
<td>74%</td>
</tr>
</tbody>
</table>

†Pizza slices were 129-144g per serving

*Compiled by Dr. Renee Rosen, University of Minnesota*
Whole Grain Modeling

- 24-hr dietary recall based on NHANES 2003-04
- 2,349 children 9-18 years
- Substituted whole grain for enriched refine grain ingredients in foods already consumed by children
- Whole grain flour replaced based on acceptability of whole grain foods tested among children in elementary schools
- Replacement levels ranged from 15-50%; most less than or equal to 25%

(Keast, et. al, 2011)
Pre-modeled Whole vs. Refined Grain Intake

Ounce Equivalents

All grains
Yeast breads
Quick breads
Pizza
Pastries
Savory snacks
RTE cereals
Rice
Pasta

RG
WG

(Keast, et. al, 2011)
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Creating Solutions Through an Integrated Grains Community

Dietary Guidance

Supply Chain

Children’s Intake

Bridge Gap
Grains for Health Foundation

- **Who are we?**
  - A Grain Community
  - We are scientists, business and health professionals working together at the grass roots to nurture all sectors, disciplines and cultures to improve public health.

- **Where are we going?**
  - Healthy Foods for All
  - We are redesigning the food supply by facilitating the development, delivery and consumption of grain-based foods that promote a balanced body weight, reduce chronic disease and curb health care costs.
What do we do?  
We are cross-disciplined in thinking and doing to build a global community that has the wisdom to create positive change for public health through the use of dynamic strategic platforms.

How will we get there?  
We are working together to investigate and leverage food systems to transform and resolve complex public health issues through human connectivity.
Grains for Health Foundation

Creating Healthy & Sustainable Grain Foods

Core Learning Capabilities

Grain Science  Child Nutrition  Systems Training

Grain Science has the Power

- **Societal Challenge**
  - Gradually increase children’s consumption of healthier grain-based foods that more closely meet the 2010 Dietary Guidelines.

- **Goal for the Grains Community**
  - To translate Dietary Guidelines recommendations into healthier grain-based foods in the marketplace that meet children’s taste expectations.
Grain Science has the Power

Outcomes

*Short-term*

- Establish **2015 Goals** for the availability of grain-based foods in the marketplace (by grain category) that allows children to more closely meet dietary guidance:
  - Increase whole grain / dietary fiber
  - Lower caloric density and adjust portion sizes
    - Less fat, sugar and salt where appropriate

*Long-term*

- Assess the 2015 availability of grain-based foods in the marketplace versus the 2010 goals.
Upcoming Events

- May 2012 Whole Grain Summit in Minneapolis, MN
  - Unite the grains community around a global strategy to meet dietary guidance through the availability of healthier grain-based foods in the marketplace.
Acknowledgements
References

- Keast DR, Rosen, RA, Arndt EA, Marquart LF. Dietary modeling shows that substitution of whole grain for refined grain ingredients of foods commonly consumed by U.S. children and teens can increase whole grain intake. *J Am Diet Assoc.* Accepted for Publication, 2011.