

Whole Grain Meals for Schools

Grains for Health Foundation
Len Marquart

Whole Grain Forum
Beijing, China
April 21st, 2011



Points of Interest

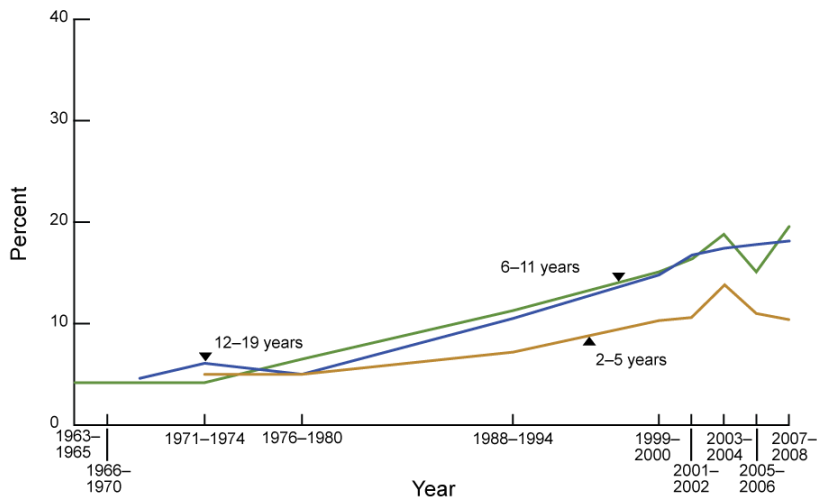


- Public Health & Nutrition Landscape
- Grains as a Vehicle to Improve Nutrition in the Food Supply
- A Challenge to the Grains Community
- YOU are the Solution

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.
SOURCES: CDC/NCHS, National Health Examination Surveys II (ages 6–11), III (ages 12–17), and National Health and Nutrition Examination Surveys (NHANES) I–III, and NHANES 1999–2000, 2001–2002, 2003–2004, 2005–2006, and 2007–2008.



America's Move to Raise a Healthier Generation of Kids



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

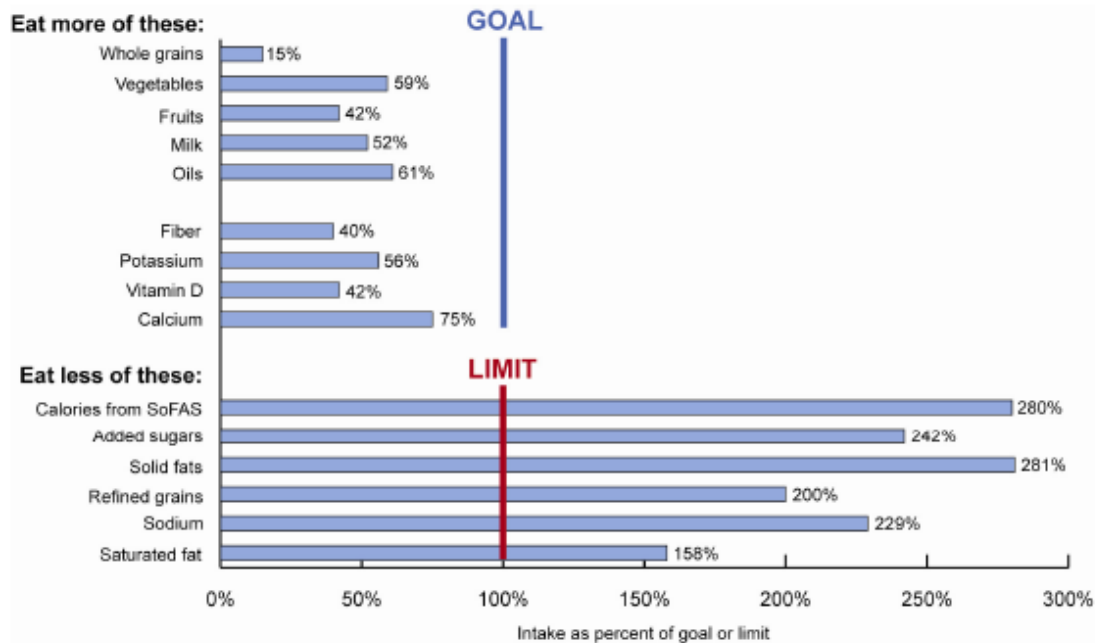


- The US food supply provides:
 - ▣ Too much solid fats, added sugars, and sodium
 - ▣ Not enough fruits, vegetables, whole grains and milk
- “Pervasive overconsumption” of these energy sources
- Leading to unnecessary consumption of empty calories
- Companion paper entitled, “Healthfulness of US Food Supply” Krebs-Smith et al. Am J Prev Med. 38: 472-477, 2010.

Current Reality



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



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.

Data source: What We Eat in America, National Health and Nutrition Examination Survey (WWEIA, NHANES) 2001-2004 or 2005-2006.

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



Natural Transition



- 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

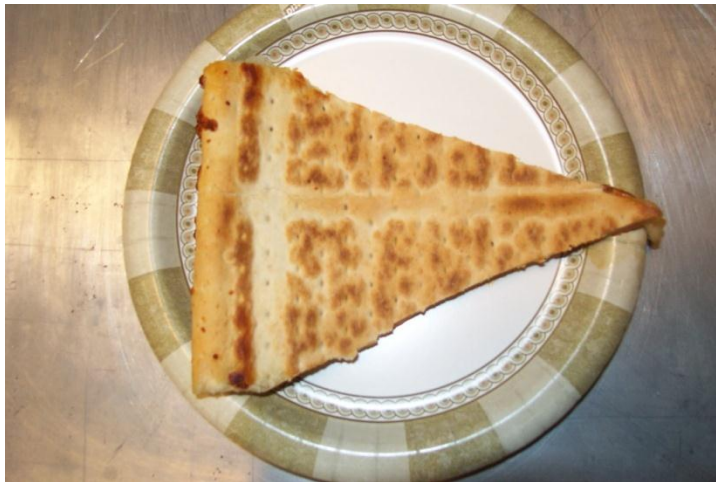


- Grain products offered on the serving line
- Weigh 10 samples of grain product to determine mean weight
- Children discard unfinished grain products into plate waste container
- Waste is weighed

(Chan, et. al, 2008)

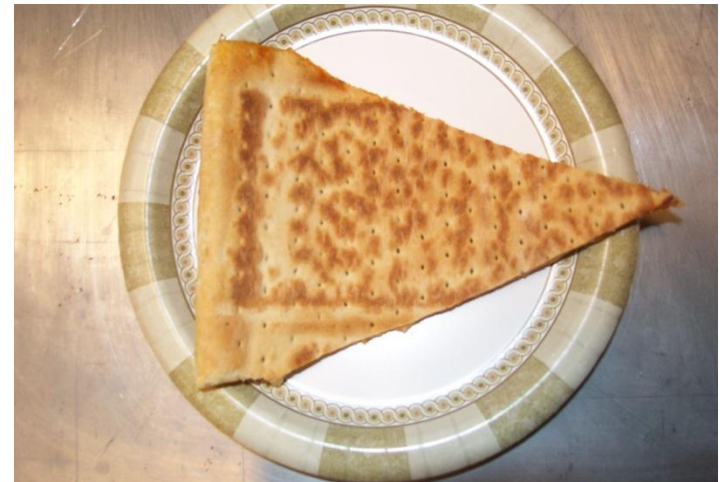
Pizza Products

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

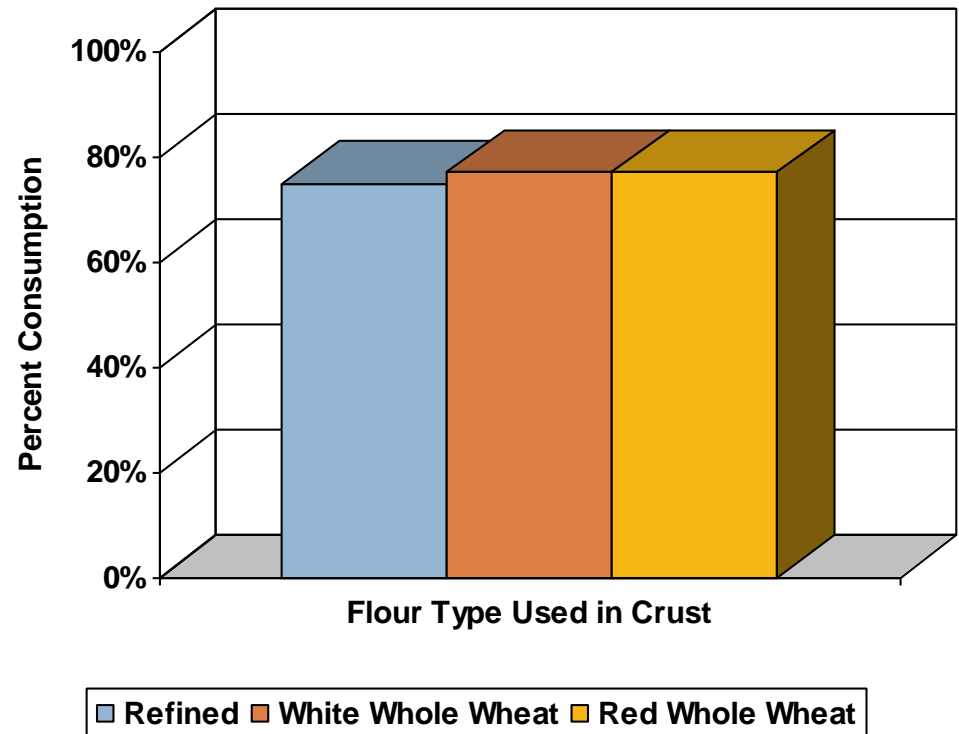
(Chan, et. al, 2008)

***Ultragrain, ConAgra Foods, Omaha, NE**

Pizza- 50/50 Flour Blend



- 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*

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

†Pizza slices were 129-144g per serving

*Compiled by Dr. Renee Rosen, University of Minnesota

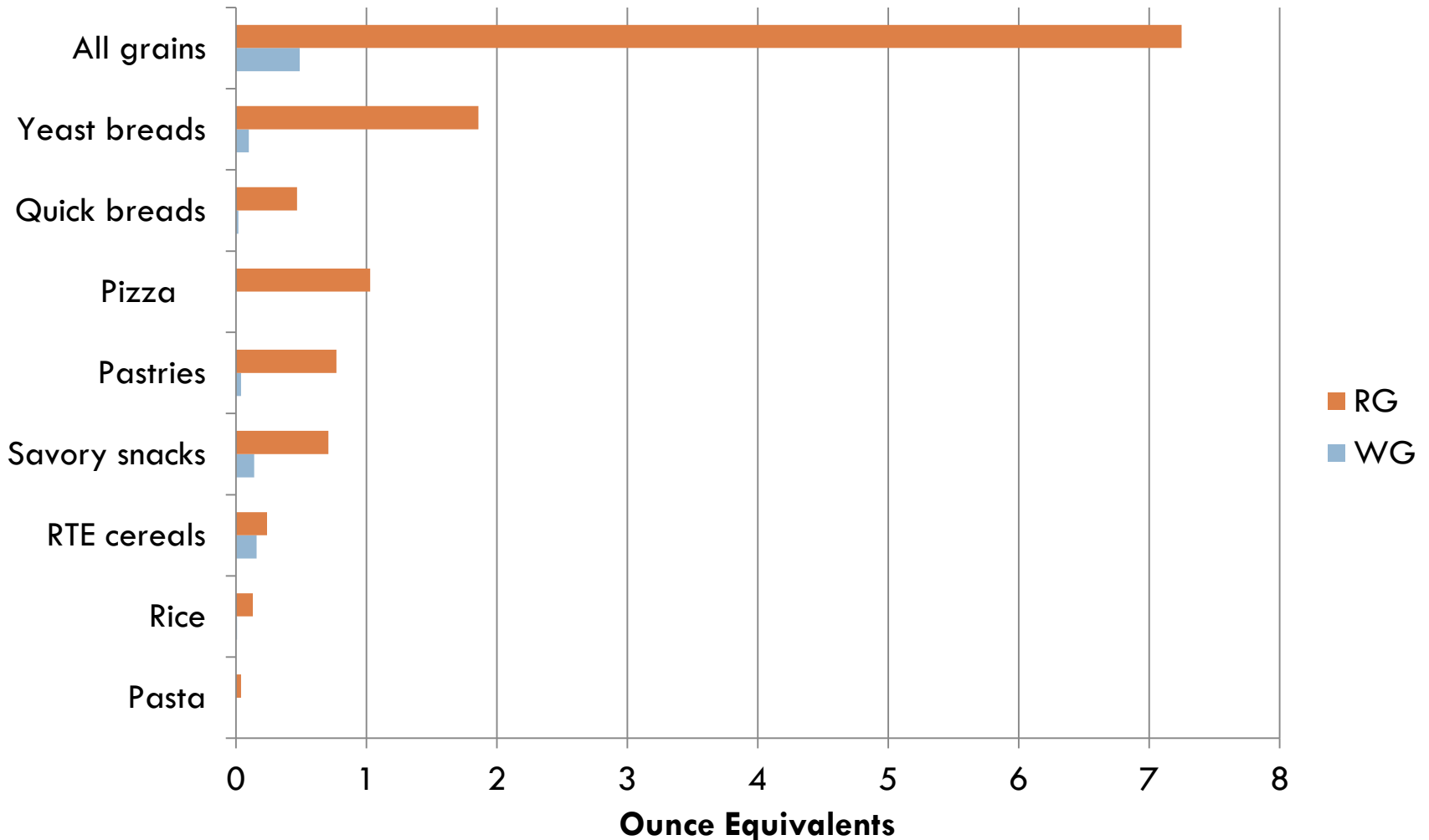
Whole Grain Modeling



- 24-hr dietary recall based on NHANES 2003-04
- 2,349 children 9-18 years
- Substituted whole grain for enriched refined 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%

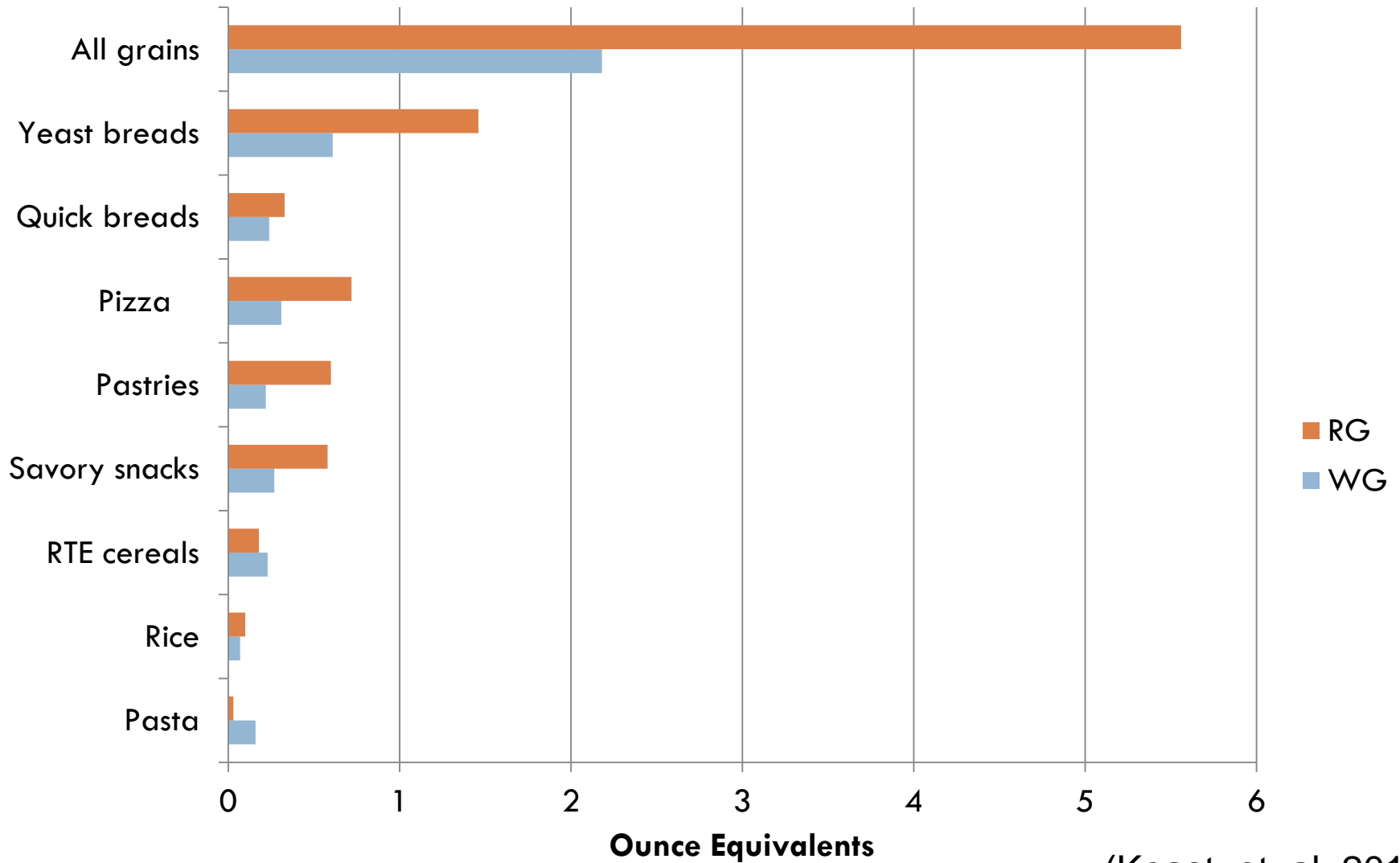
(Keast, et. al, 2011)

Pre-modeled Whole vs. Refined Grain Intake



(Keast, et. al, 2011)

Post-modeled Whole vs. Refined Grain Intake



(Keast, et. al, 2011)

Grains as a Vehicle to Health

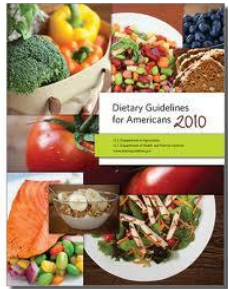


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 - ▣ Whole grain & fiber
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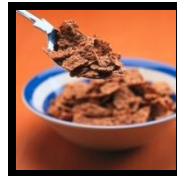


Creating Solutions Through an Integrated Grains Community

Dietary Guidance

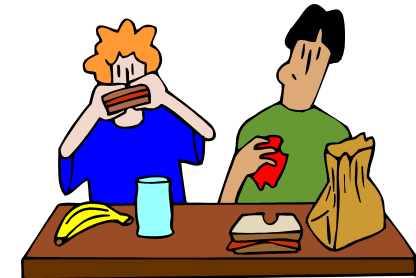


Supply Chain



Bridge Gap

Children's Intake



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.

Grains for Health Foundation

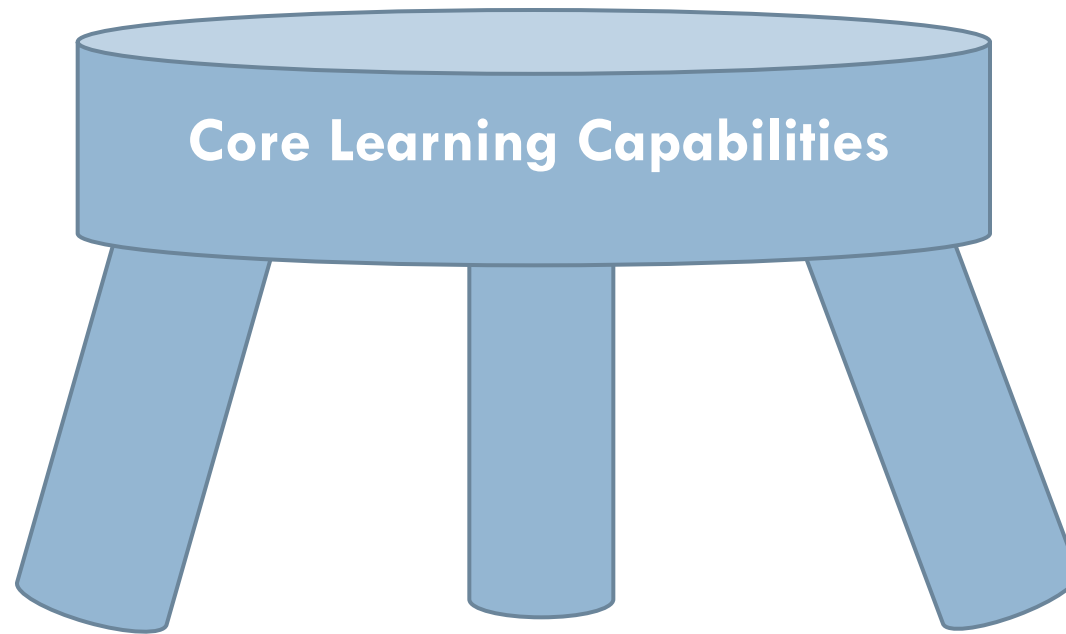
- **What do we do?** **Global Grain Community**
 - We are cross-disciplined in thinking and doing to build a global community that has the wisdom to create positive change for public health through the use of dynamic strategic platforms.

- **How will we get there?** **Collective Solutions**
 - 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



Grain Science

Child Nutrition

Systems Training

Senge, Peter et al. *The Necessary Revolution*. Doubleday; New York, 2008.

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.



YOU



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



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