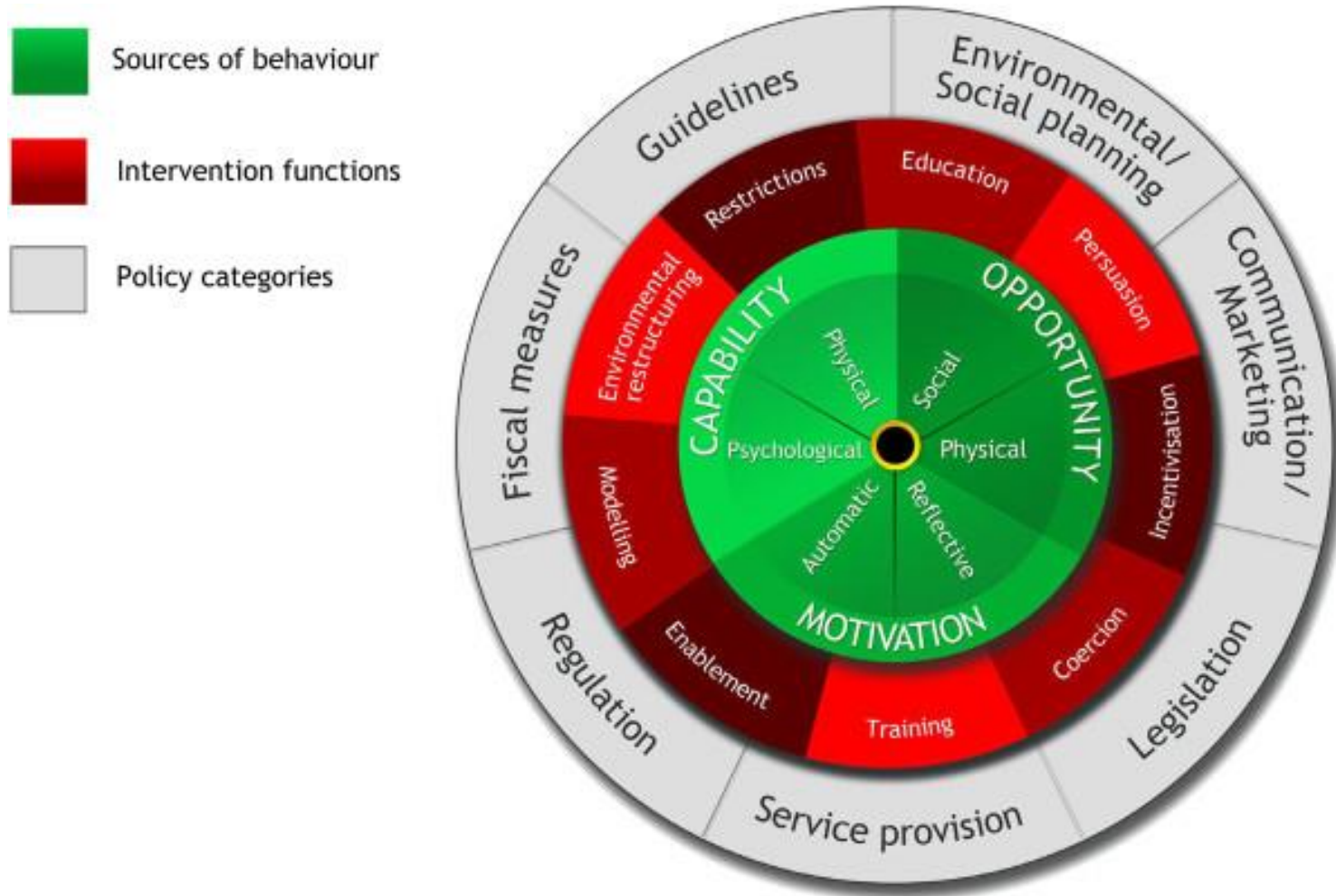


Things that Work for Adolescents




Robert Murray MD
Department of Human Sciences
Ohio State University

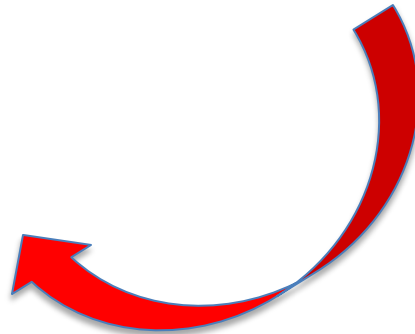
Behavior Change Policy Wheel



Differences Become Disparities

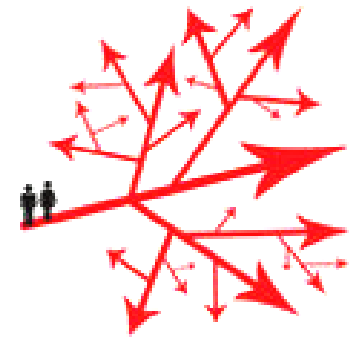
- Genetic predisposition
 - Socioeconomic
 - Educational
 - Cultural
 - Geographic
- 
- Pregnancy
 - Feeding styles
 - Activity habits
 - Neighborhood
 - Access
 - Opportunities
 - Achievement

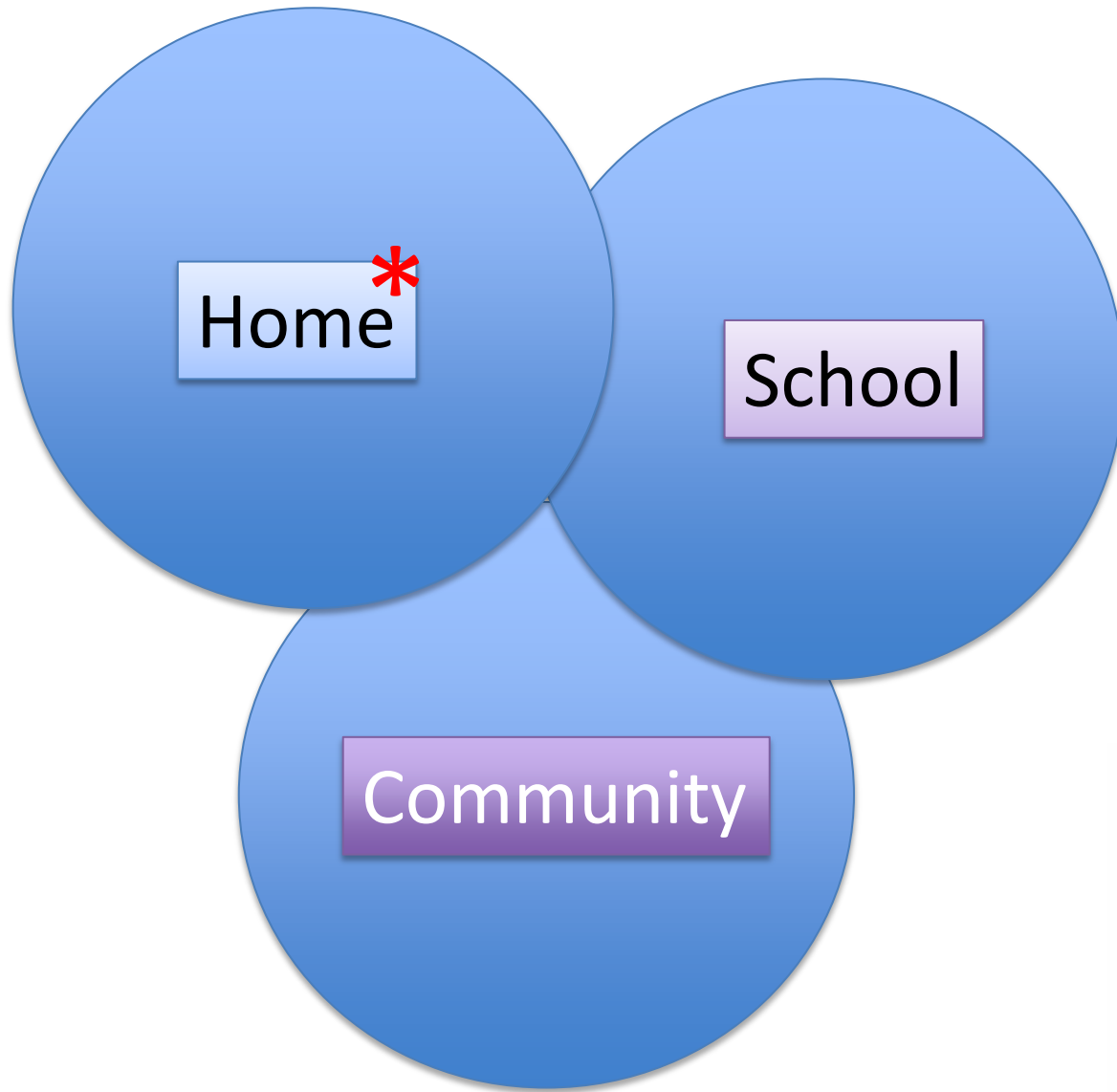
Health Disparities



Safety Net Programs & Policies

- WIC
- SNAP
- Medicaid
- School Breakfast
- National School Lunch
- Child & Adult Care Feeding Program
- Summer Meal Program
- After-school Program
- Head Start
- Early Head Start
- Food pantries
- Housing
- Job training





Discussion Touch Points

- BMI is *not* our best focus
- Promote diet quality
- Optimize successes
- The power of incremental change
- Psychology is fundamental
- The food trinity: *Taste, Value & Convenience*
- *Friends & Fun*
- Structure & Sleep

Why Not BMI?

By age 10 years
the overweight or obese child
has an 80% risk
of adult
obesity.

What are our goals?

Diet Quality & Regular Activity = *Health*



- **Heart Disease**
- **Stroke**
- **Diabetes**
- **Obesity**
- **Hypertension**
- **Metabolic syndrome**
- **Osteoporosis**
- **Cancers**
- **Alzheimer's**



US Dietary Guidelines

5 food groups – all meals & snacks

- Fruits
- Vegetables
- Whole grains
- Low-fat milk and dairy
- Lean meats, quality protein

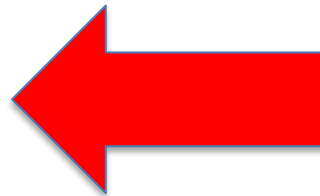


Foods to Promote

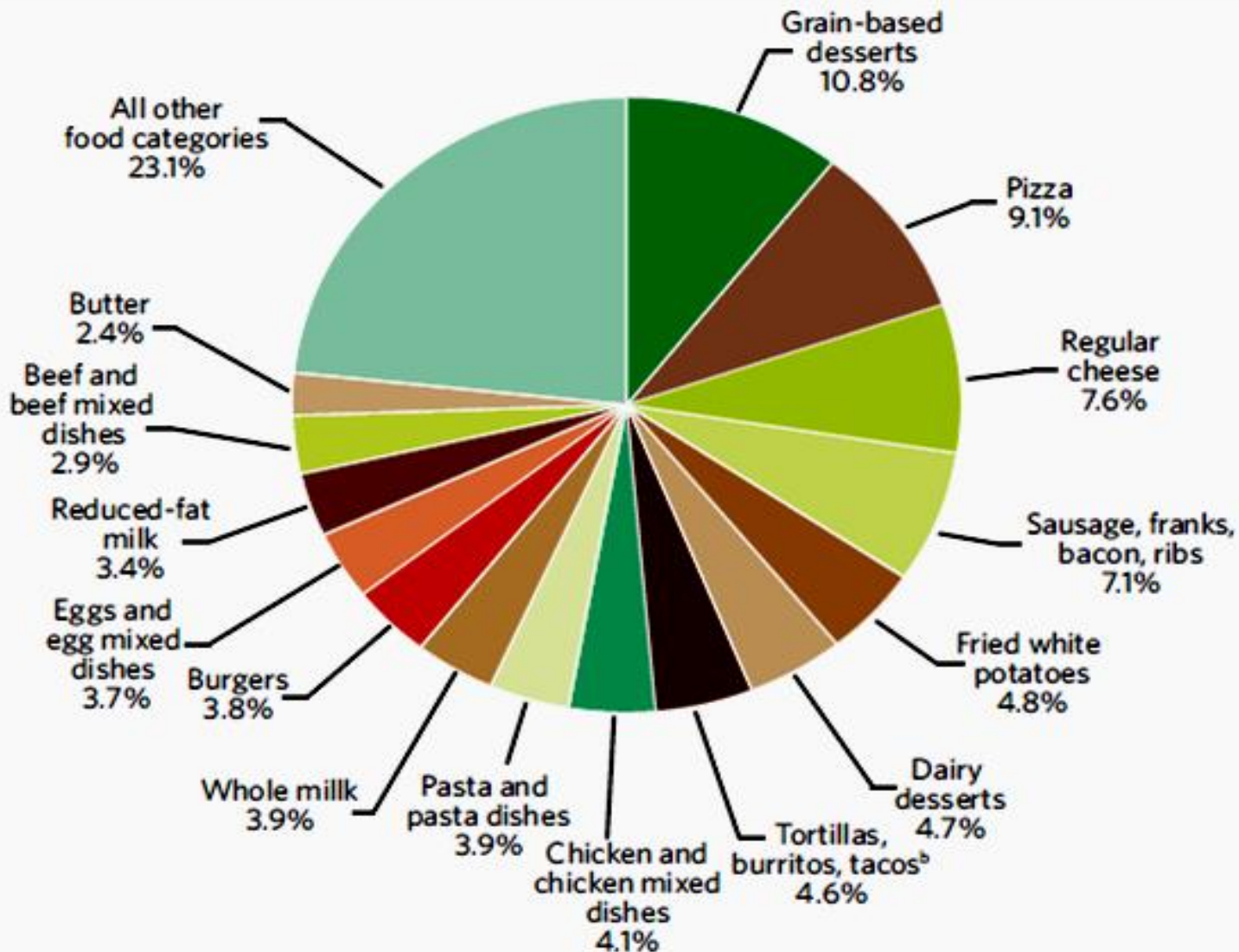
- Nutrient Rich Foods
- Nutrients of Concern:
Calcium, Vit D, potassium, fiber

Foods to Limit: Excess calories

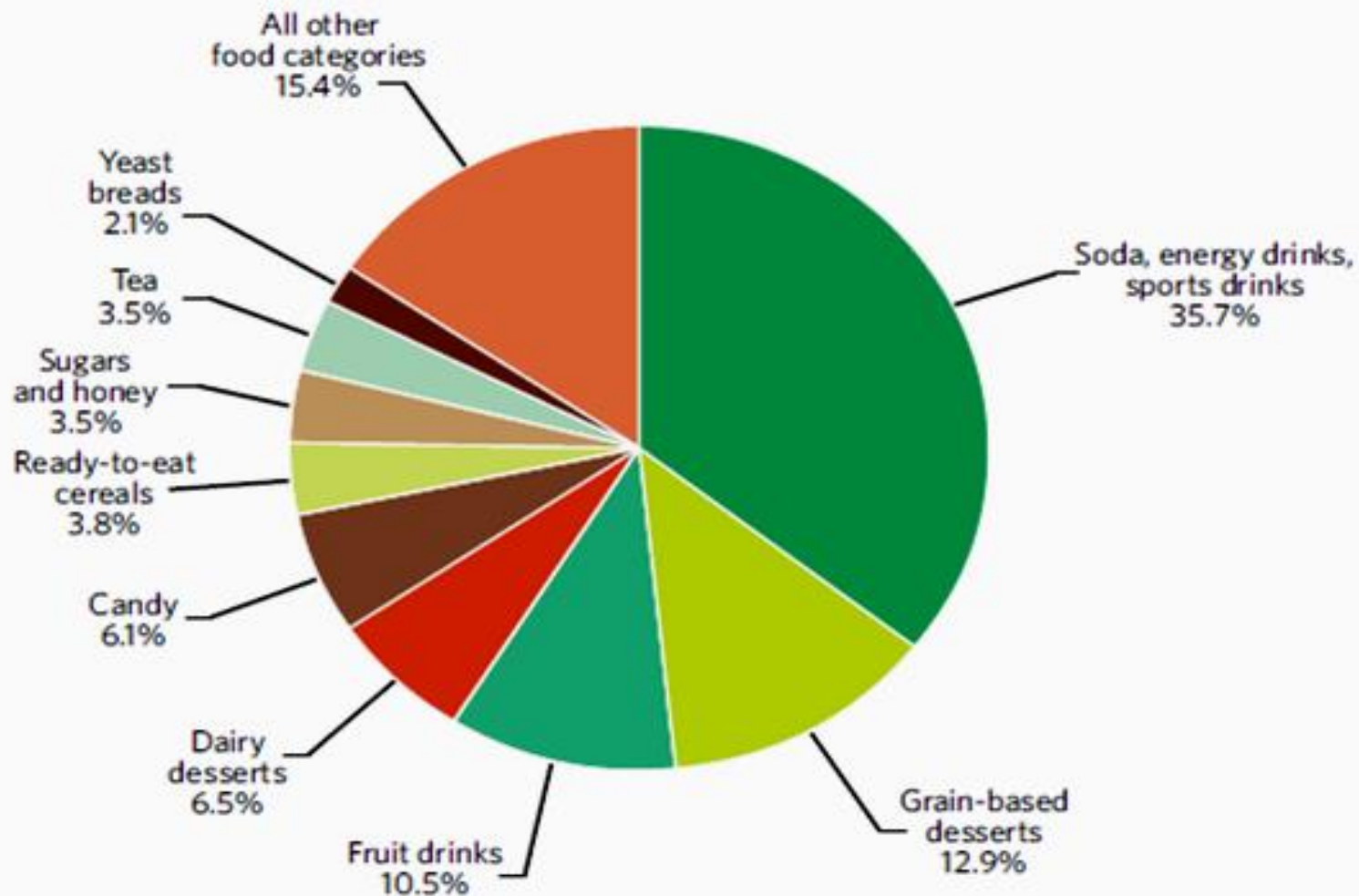
- Saturated fats
- Added sugars
- Sodium



Food Sources of Solid Fats



Food Sources of Added Sugars



What would happen
if I banned
all *flavored* yogurt
for adults
to cut sugar?





A Quality Dietary Pattern

5 food groups – meals & snacks

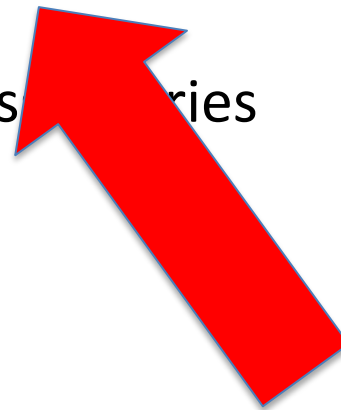
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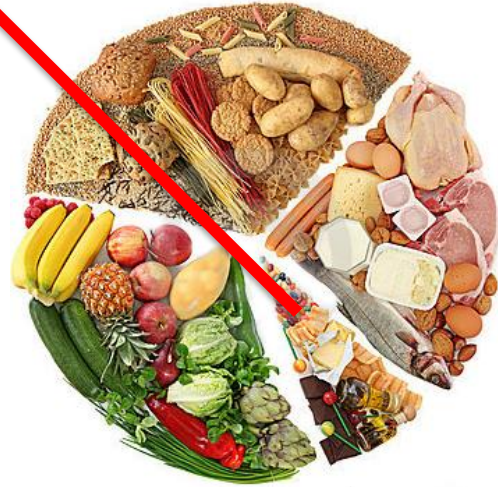


TEN Power Foods!

- **Milk**
 - Protein, calcium, Vits D, A, potassium, B vits, phosphorous, magnesium, zinc, niacin, folate
- **Sweet Potatoes/ Squash**
 - Carotenoids, Vit C, potassium, fiber
- **Spinach, kale**
 - Vit A,C,K, folate, potassium, mag., iron, phytochemicals
- **Tomatoes**
 - Vit A,C, fiber, phytochemicals
- **Broccoli, green beans**
 - Vit C, folate, carotenoids
- **Rye, wheat, oat crackers**
 - Whole grain, fiber
- **Citrus fruits**
 - Vit C, fiber, folate
- **Blueberries, blackberries**
 - Vit C, fiber, folate, potassium
- **Salmon et al**
 - Omega-3 fatty acids, protein
- **Nuts, seeds**
 - Fiber, protein, MUFA/ PUFA, omega-3 FA (walnuts), vit E (almonds), folate (peanuts)

★ *Purees, Stocks, Mixed Dishes*

Small Swap-Outs



Use *acceptable amounts* of
fats and sugars
To drive consumption
Of
Nutrient rich foods
and drinks

Associative Conditioning

“flavor-nutrient learning”

pairing new foods & flavors
with those that
are liked
increases
acceptance

even more than repeated exposure.



**Strategies
for
Achieving Diet Quality**



The fastest, easiest road to diet quality

Scenario #1:

Substitutions for a lower fat, lower sugar alternative

- Regular to low-fat cheese
- Easy for consumer
- Modeled 130 foods, drinks in 20 food subgroups = 99 possible substitutions
- **Goals met:** total and sat fat, cholesterol, carbs and sugar
- Almost *no* improvement in other nutrients
- Energy (kcal) intake fell

Scenario #2:

Substitution of foods, beverages within same subgroup

- White rice to long-grain rice
- Easy for consumer, retains personal and cultural tastes
- Modeled 1105 foods, drinks in 64 food groups = 28,044 possible substitutions
- **Goals met:** for nearly *all* nutrients; rapid rise in PANDiet score
- Energy (kcal) intake fell

Food & Beverage Subgroups

- Soda, energy drinks, sports drinks, juices
- Grain desserts
- Dairy desserts
- Dry cereals
- Cooked cereals
- Breads
- Milk, cheese, yogurt
- Crackers
- Fruits
- Vegetables
- Pizza
- Fast food
- Tacos, burritos
- Nuts, seeds
- Eggs
- Meats
- Fish

Same Choice but with **Simple Swaps...**

- Onion Dips to Salsas
- Chips to whole grain, fiber crackers
- Hummus with pita to veggies
- Pudding or dessert to Yogurt – to parfait for fruit
- Cereal to whole grain – to dried fruit, nuts
- Cake to carrot cake, zucchini bread
- Sugar cookies to oatmeal nut cookies
- Frozen waffles to French toast

Drinks: Calories vs Nutrients

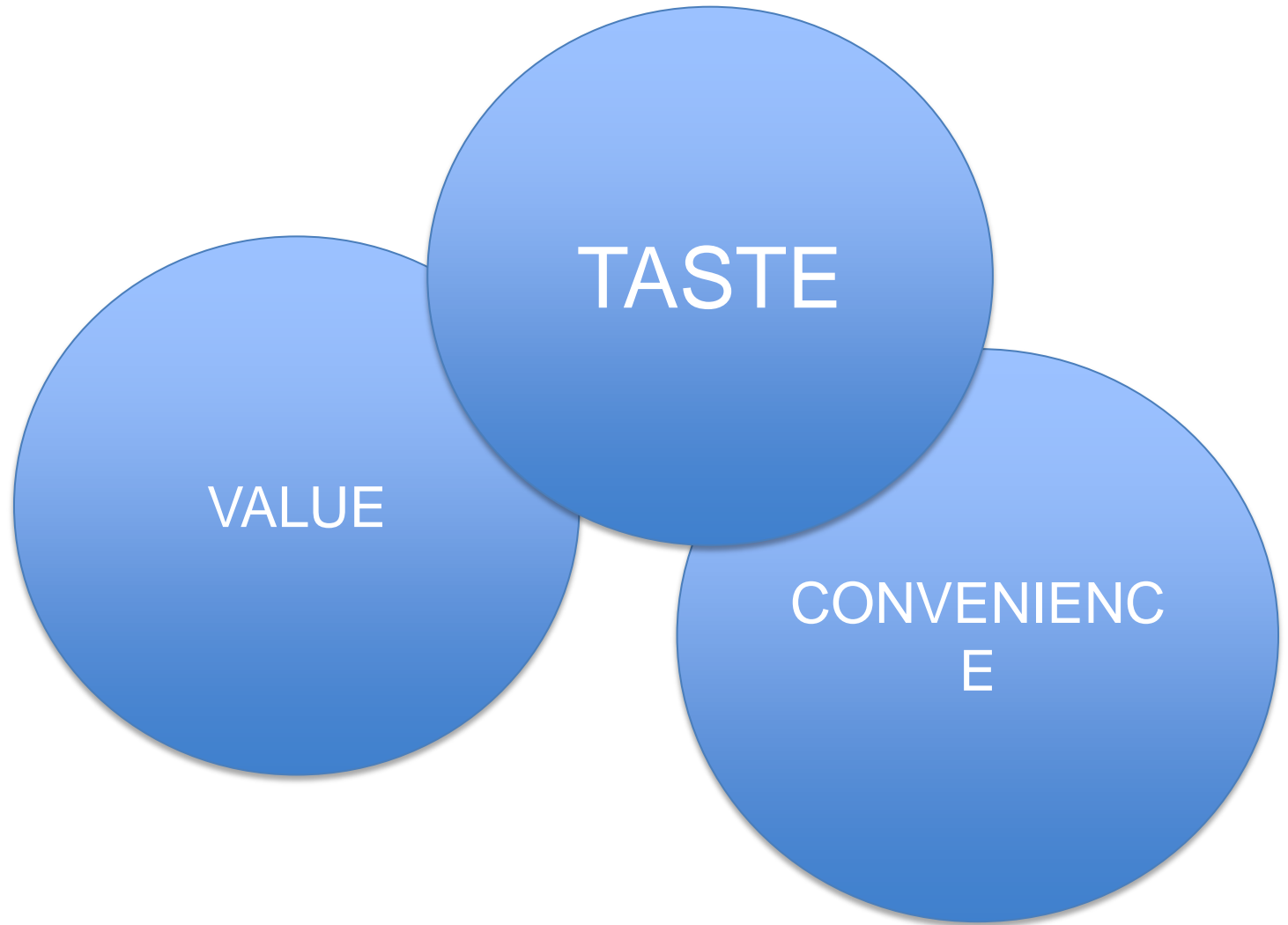
- Water
- Milk
- Soft drinks
- Energy drinks
- Rehydration drinks
- Fruit juice
- Alcohol *and calories*



The power
of
incremental change



The **Holy Trinity** of Food Choice



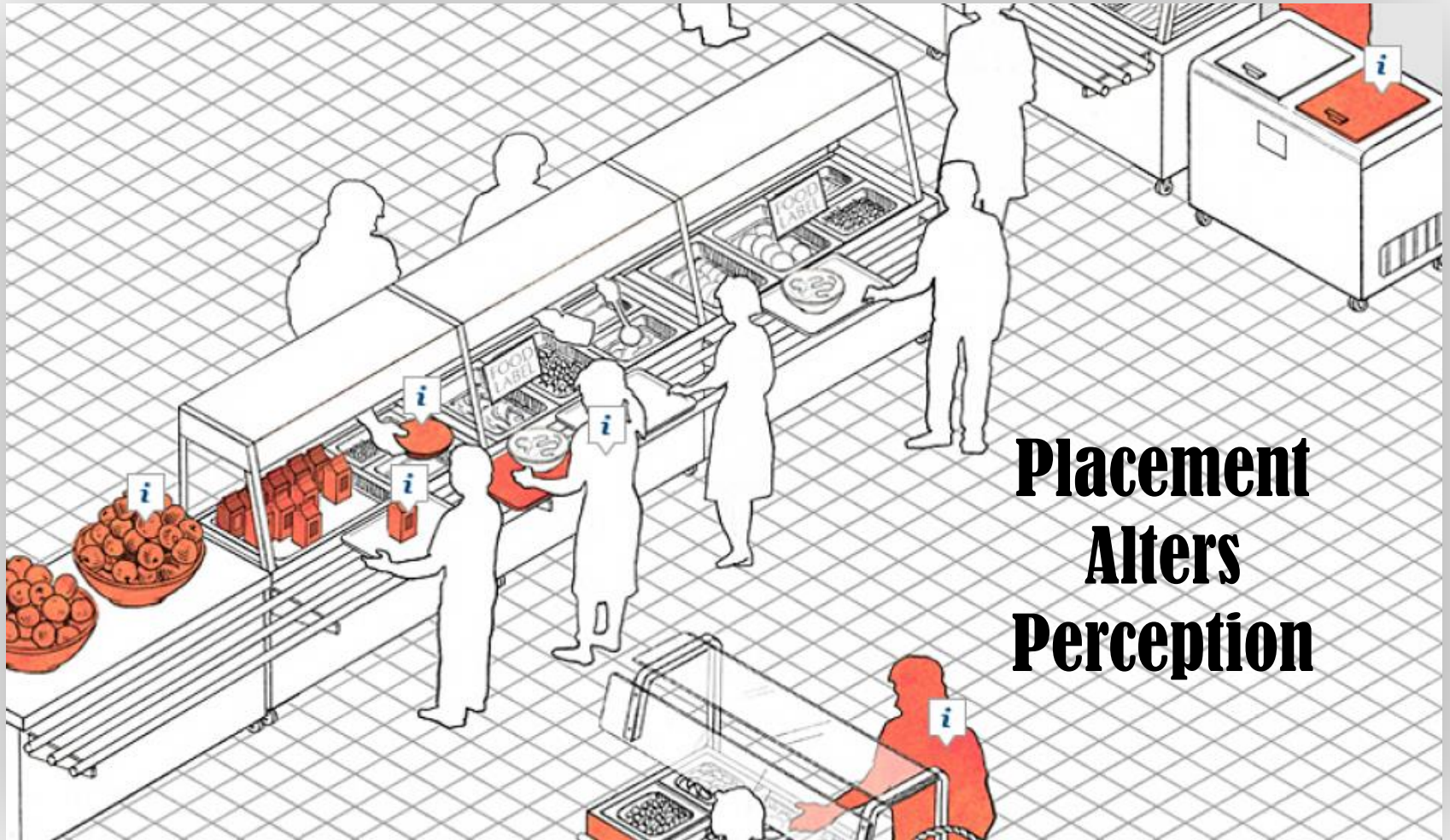
Behavioral Psychology

- Pricing: short vs long term
- Self-service, convenience
- Simple sells:
 - good vs bad; stoplight schemes
- Buffet: “all you can eat” and “sunk cost” awareness
- Distractions, socialization increase consumption
- Ambiance
- Satiety:
 - internal vs external cues
 - Plates, spoons, glass sizes, bottle size
- Reactance = we rebel when denied or forced
- Self-attribution = we enjoy our choice if it's ours

Brian Wansink, Cornell University

Chandon, Wansink. Nutr Rev 2012; 70:571

Smarter Lunchroom Movement



**Placement
Alters
Perception**

Convenience

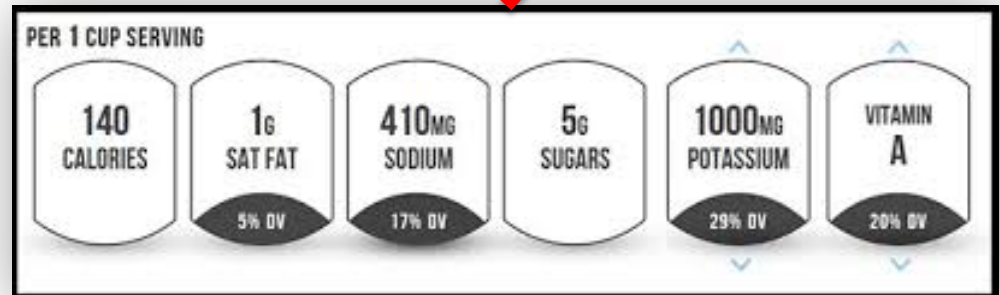
- Make your own
- Salad bars
- Prepackaged
- Bundled foods: *entrée, side, drink*
- Grab 'n Go
- Food debit cards
- “Cash only” for less nutritious items

Incentives Drive Choice

- Sales
- Pre-ordering
- Comparison of costs and benefits
- Bundling better with popular
- Subsidize better choices *or* increase cost of empty calories?
- *Inconvenience* lines for empty calories

@ Point of Sale

- Nutrition information: *two-edged*
- Food Label & *Facts Up Front*
- Tasting tables
- Make Your Own
- Branding: local
- Cause: sustainable
- Snarky titles



Salience: Marketing with **Eye Candy**



Positive School Climate Works

“Optimize Successes”



Healthier US Schools Challenge



<http://www.fns.usda.gov/hussc/application-materials>

Help? Ohio Action for Healthy Kids.org

The School Nutrition Success Story



- 55 million students
- 32 million lunches/day
- 35-40% calories at school
- Improves nutrition
- ★ • Lessens obesity
- Improves behavior
- Boosts academic achievement

New Nutrition Standards for Schools

- Meal *servings* based on Dietary Guidelines
- Access to water
- Easier to qualify for school meal eligibility
- Nutrition and wellness in child care sites
- Local farm-to-school efforts
- Improved commodity food quality
- Food safety standards and rules
- Education for school nutrition staff
- 6 cents per meal to improve nutrition
- ***USDA given authority over all vended foods***



Energy-Dense, Nutrient-Poor Foods



- **Snacking = 30- 40% of daily energy**
- Daily calories increased
- Carbohydrates increased
- Fats increased
- ***Displace: Protein, fiber, vitamins, folate, calcium, magnesium, iron, zinc***

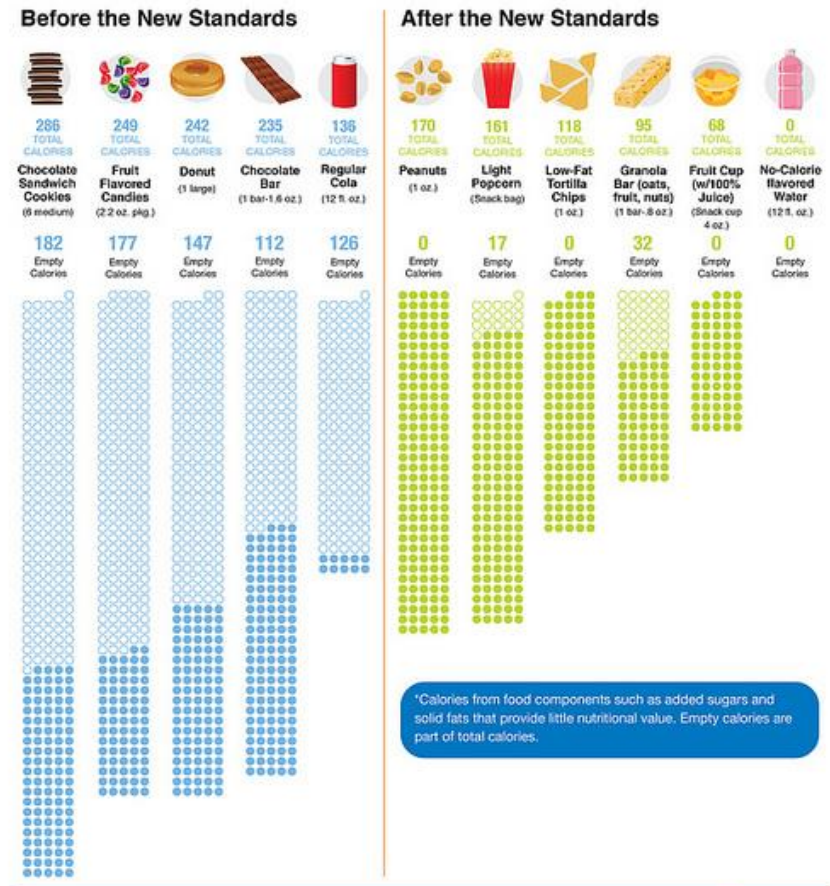
New Rules

- Any of 5 food groups
- Grains: whole grains
- Combination foods with ¼ cup fruit or veggie
- 10% Daily Value (DV) of calcium, vit D, potassium, fiber
- Any entrée from NSLP
- Drinks: water; non-fat flavored or low-fat white; 100% juices
- Limits: Kcals \leq 200kcal; Fat \leq 35% of calories; sat fat \leq 10%; sugar \leq 35% of weight; sodium \leq 230 mg

SMART SNACKS IN SCHOOL

The Healthy, Hunger-Free Kids Act of 2010 requires USDA to establish nutrition standards for all foods sold in schools—beyond the federally-supported meals programs. This new rule carefully balances science-based nutrition guidelines with practical and flexible solutions to promote healthier eating on campus. The rule draws on recommendations from the Institute of Medicine, existing voluntary standards already implemented by thousands of schools around the country, and healthy food and beverage offerings already available in the marketplace.

● Equals 1 calorie ○ Shows empty calories*



But... Other Foods in School

Rewards
Celebrations
Fundraisers
School Stores
After-Hours Vending
Booster Sales
Athletic Events
Student Clubs



Parents
Teachers
Staff
Students

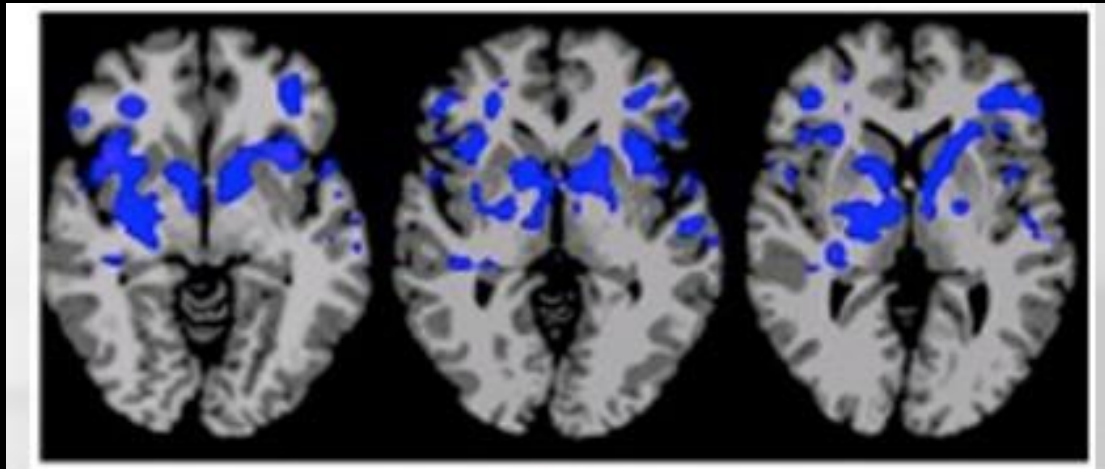
Nutritional Contribution of School Breakfast Program

- Greater energy/ day
- Vit C
- Phosphorus
- Calcium
- Magnesium
- Riboflavin
- Fiber



Energy and micronutrients not consumed at breakfast are not made up over 24 hrs

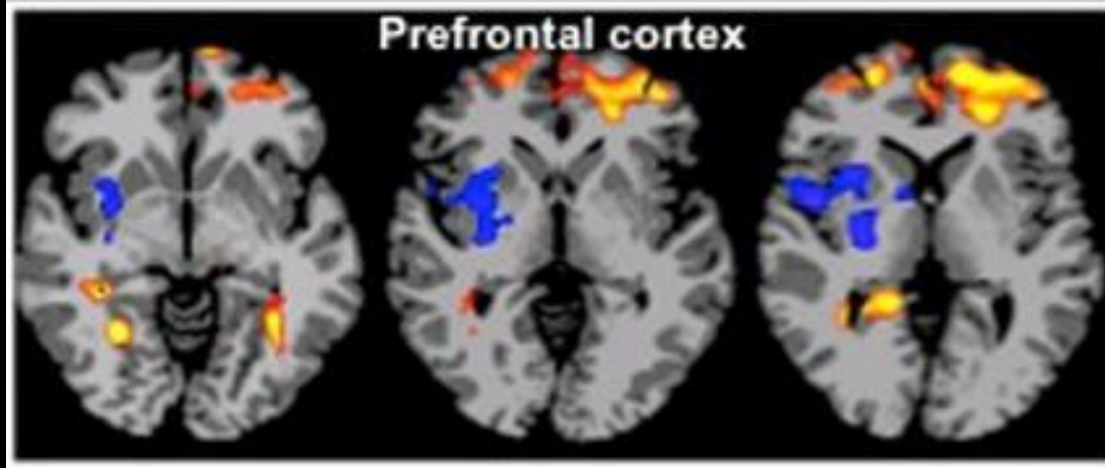
Fasting vs Glucose-Rich Brain



FASTING

The Mid-Brain
Food Seeking Mode

** Distracted,
irritable, Restless,
anxious*



Glucose-rich

The Front Brain
Working Mode

** Calm, focused,
organized,
thoughtful*



45 Studies

Breakfast Science

- **Nearly all showed a positive effect**
 - Vulnerable kids most effect
 - *School* BF most consistent effect
- Math & Memory better
- Memory, attention better
 - Late morning especially
 - Better on more demanding tests
- **High-risk children** showed better
 - Verbal skills
 - Memory
 - Matching tests

The 1,2,3 of Grab 'n Go Breakfast



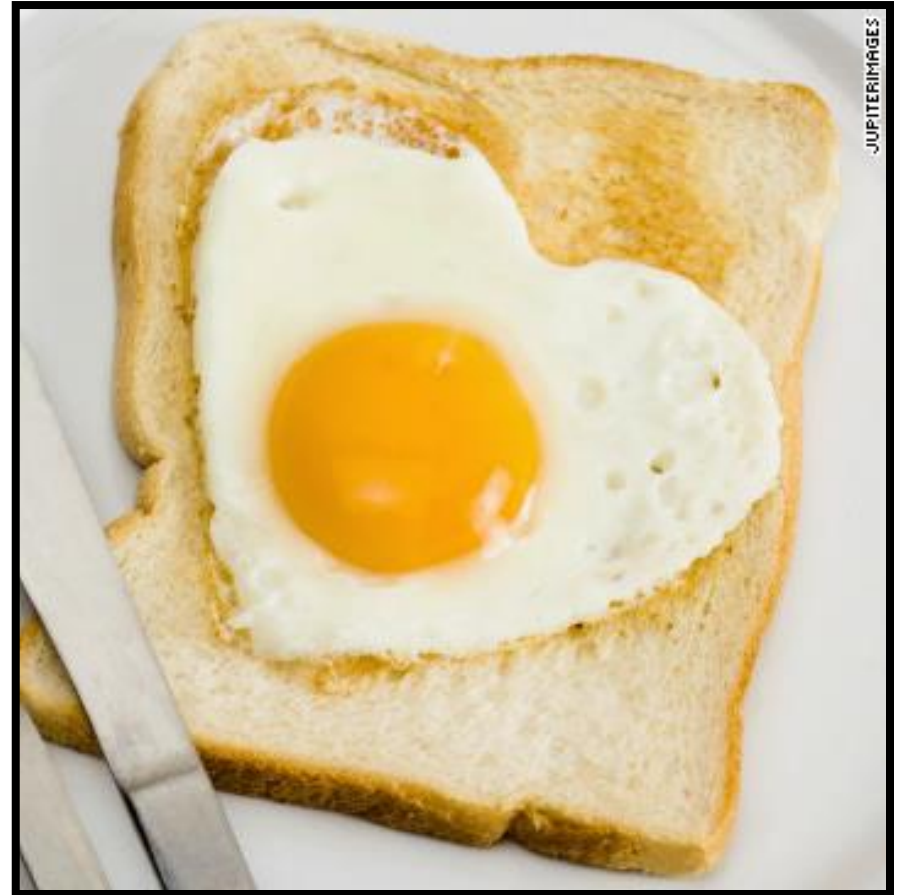
1. A quality breakfast

1. Together with friends

1. And a teacher's smile

And Yet... Only 1/3 of Eligible Kids Get Breakfast at School

- Less hunger during school
- More attentive, fewer behavioral problems
- Increased attendance
- Less tardiness
- Fewer visits to school RN
- Lower obesity rates
- Math scores 17.5% higher
- Higher graduation rates



The Ohio School BF Challenge

<http://www.ohioschoolbreakfastchallenge.com/>

Share Our Strength/ Delloite Study, 2013

Speed BF



Cereal Bars

120 kcal

High in Vit A, Calcium, Zinc, Vit B6, Iron

Balance carbs, fats, proteins

Whole grains



Energy Bars

230 kcals

Grains, fruit

High in potassium, Vit A, Vit C,
Calcium, Iron, Vit D, Vit E, fiber,
Vit B12, Magnesium, Zinc, etc.

Balance: fats, carbs, protein



Nutrition Facts

Serving Size: 1 packet (36g)	
Amount Per Serving	
Calories 130	Calories from Fat 0
% Daily Value*	
Total Fat 0 g	0%
Saturated Fat 0 g	0%
Trans Fat 0 g	
Cholesterol 5 mg	2%
Sodium 100 mg	4%
Potassium 240 mg	7%
Total Carbohydrate 27 g	9%
Dietary Fiber 0 g	0%
Sugars 18 g	
Sugar Alcohols	
Protein 5 g	
Vitamin A 1750 IU	35%
Vitamin C 27 mg	45%
Calcium 250 mg	25%
Iron 4.5 mg	25%

Yogurt & ...

90-250 kcal

Calcium, Vit D

Other Vits & Minerals



Instant breakfast & Milk

130 kcals + non-fat milk = 220 kcals

High in potassium, Vit A, C, Calcium, Iron
w/ milk it blends carbs, protein, fats

Innovation: **Community Eligibility**

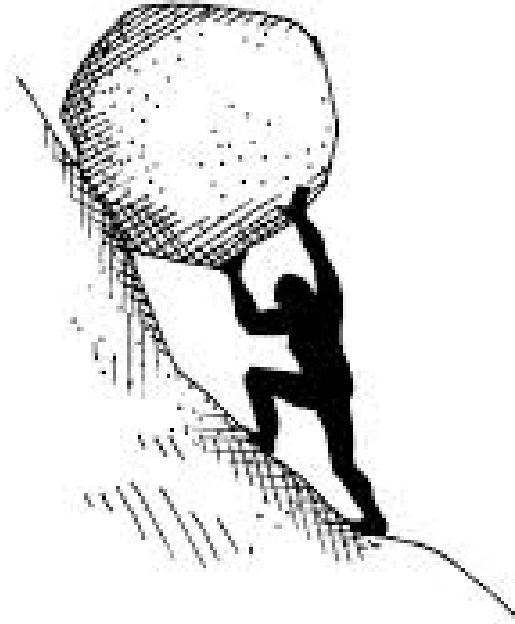
USDA

- Schools reimbursed through a formula
- Number of “identified students”
- Foster care, HeadStart, homeless, migrants, SNAP homes, TANF food assistance
- 40% of students = threshold

Middle School

- Skip meals, breakfast
 - Peers predominance
 - Snacking
 - Fad diets
 - Sedentary
 - Multiple screens
- ★ Misperceptions of peer behaviors, attitudes

Physical Activity



Friends

&

Fun



Physical Activity: Teen Focus Groups

Perceived positives:

- Fun
- Achievement
- Physical-related factors

Teen recommendations:

- Increase peer support
- Availability at school & in neighborhood
- Organized activities
- Restructure PE

Perceived barriers:

- Lack of peer support
- Low accessibility
- Structure of PE
- Distance

Most activity:

- Recess morning and at lunch

Less activity:

- Active transportation
- After-school

Institute of Medicine Report

May 2013

60 minutes per day



<http://iom.edu/Reports.aspx>

A Whole-of-School Approach:

- Before school
- PE Daily
- Recess Daily
- 10-minute Breaks between classes ★
- Clubs
- After-school activity
- Active field trips

Do You Call it
“Exercise”
or
“A Break in the Day”?





Optimal brain processing
requires
a period of relaxation
after a period of
concentrated learning

W
I
N



W
I
N

Engagement: Apps, Gadgets, Tools

- Internet training vs in-person counseling
- Branded and social
- Fund-raising/ charities: Cleanups, gardens, carwash, mulch deliveries, projects
- “Challenges” vs other groups
- Walking conversations
- Dance club – after-school LA trial

Feedback

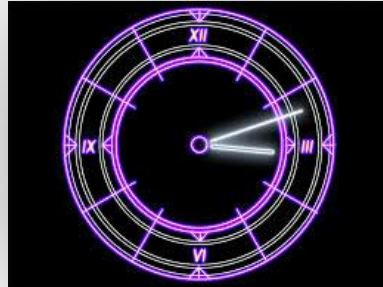
- *Personal Best* portfolio w/ recommendations, feedback
- Apps: self-monitoring; send/ receive greetings, congratulations, encouragement, tips
- Tracking: Fitbit, pedometer



Sleep & Structure & Stress

Sleep:

- Performance
- Weight
- Carb craving
- Stress relief



Structure:

- Meals, snacks
- Breaks/ recess
- Activities
- Set bed time

CDC Resources: http://www.cdc.gov/sleep/about_sleep/index.htm

AAP policy statement: http://www.cdc.gov/sleep/about_sleep/index.htm

Community *friends & fun*

- Availability & access
- Marketing & awareness
- Opportunities: summer, holidays, weekends
- Neighborhood, ethnicity, gender
- Built environment – transportation, gardens, bike paths, green space, water, skate parks, rec centers, community markets, malls





Small Steps

- Diet quality
- Optimize successes
- Incremental changes
- Behavioral Psychology
- *Taste, Value & Convenience*
- *Friends & Fun & PA*
- Structure & Sleep & Stress