

10 Things You Must Know About Pediatric Nutrition

R Murray MD

Center for Healthy Weight & Nutrition

Nationwide Children's Hospital

FRUITS

WHOLE
GRAINS

LOW-FAT MILK
& DAIRY

VEGETABLES



QUALITY
PROTEINS

#1. WHAT IS QUALITY NUTRITION?

U.S. Dietary Guidelines

- Consume **meals and snacks** from the 5 food groups
 - **Fruits**
 - **Vegetables**
 - **Whole grains**
 - **Low-fat milk and dairy**
 - **Lean meats, quality protein**

- Balance food intake with **daily activity**

- Get nutrition from every calorie consumed
 - **nutrient rich foods**



2.

		Activity = Calories		
Gender	Age (years)	Sedentary	Moderately Active	Active
Child	2-3	1,000	1,000-1,400	1,000-1,400
Female	4-8	1,200	1,400-1,600	1,400-1,800
	9-13	1,600	1,600-2,000	1,800-2,200
	14-18	1,800	2,000	2,400
	19-30	2,000	2,000-2,200	2,400
	31-50	1,800	2,000	2,200
	51+	1,600	1,800	2,000-2,200
Male	4-8	1,400	1,400-1,600	1,600-2,000
	9-13	1,800	1,800-2,200	2,000-2,600
	14-18	2,200	2,400-2,800	2,800-3,200
	19-30	2,400	2,600-2,800	3,000
	31-50	2,200	2,400-2,600	2,800-3,000
	51+	2,000	2,200-2,400	2,400-2,800

PORTION SIZE IS THE KEY



= 1 cup, so 1/2 is one serving for fruits, veggies



= the fist a serving for starches (potatoes, rice, mac n cheese)



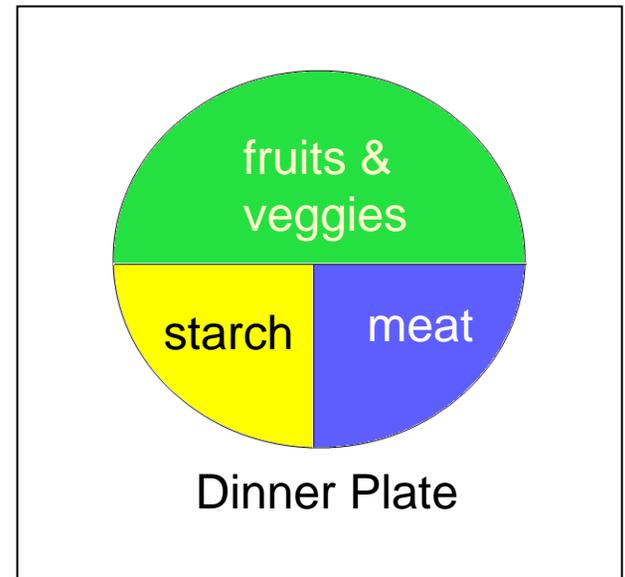
= 2 tablespoons of peanut butter



= 1.5 ounce serving of cheese



= the palm is an age-appropriate meat portion



#3. Nutrient Rich Foods

“Consume a variety of **nutrient-dense foods and beverages** within and among the basic food groups

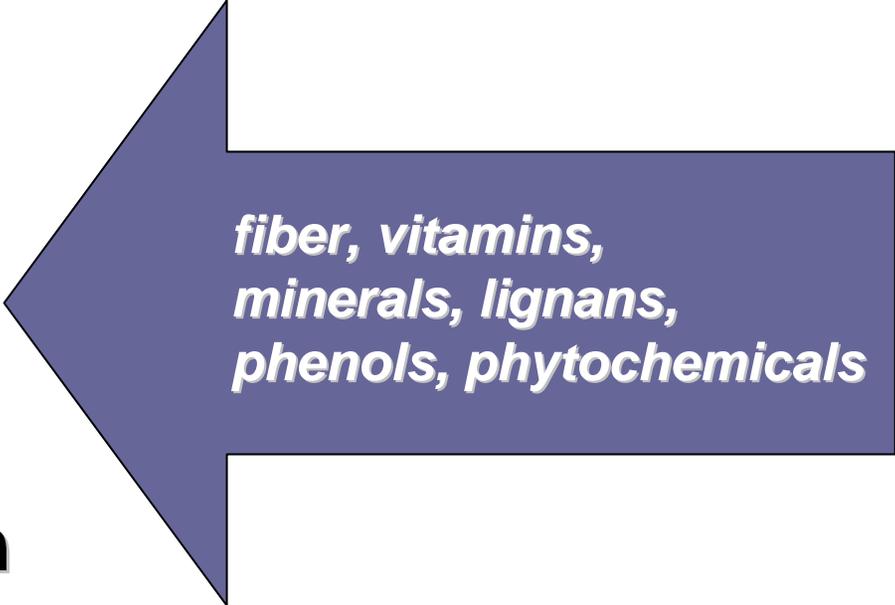
while choosing foods that limit the intake of saturated and *trans* fats, cholesterol, added sugars, salt and alcohol.”

TEN Power Foods!

- **Sweet Potatoes/ Squash**
 - Carotenoids, Vit C, potassium, fiber
- **Spinich**
 - Vit A,C,K, folate, potassium, mag., iron, phytochemicals
- **Tomatoes**
 - Vit A,C, fiber, phytochem
- **Salmon**
 - Omega-3 fatty acids
- **Blueberries**
 - Vit C, fiber, folate, potassium
- **Broccoli**
 - Vit C, folate, carotenoids
- **Rye crackers**
 - Whole grain, fiber
- **Brown rice**
 - Whole grain, fiber, vit E, B-6, zinc, magnesium
- **Citrus fruits**
 - Vit C, fiber, folate
- **Nuts**
 - Fiber, protein, MUFA/ PUFA, omega-3 FA (walnuts), vit E (almonds), folate (peanuts)

#4. The Health Benefits of Whole Grains

- **Stroke**
- **Type II Diabetes**
- **Heart disease**
- **Hypertension**
- **Weight management**
- **Asthma, inflammation**
- **Colorectal cancer**
- **Gum and tooth disease**



*fiber, vitamins,
minerals, lignans,
phenols, phytochemicals*

The Whole Grain

- **Bran**
 - Outer kernel
 - Antioxidants, B vits, fiber
- **Germ**
 - Embryo
 - B vits, proteins, minerals, good fats
- **Endosperm**
 - Energy for plant
 - Starchy carbs, proteins

Bran & germ =

25% protein & 17 key nutrients

The Language of Whole Grain

- ***YES:***
 - **Whole grains**
 - **Whole wheat**
 - **Whole [grain]**
 - **Stoneground whole [grain]**
 - **Brown rice**
 - **Oats, oatmeal**
 - **Wheatberries**
- ***NOT:***
 - **Bran**
 - **Wheat germ**
- ***Maybe:***
 - **Wheat flour**
 - **Semolina**
 - **Durum wheat**
 - **Organic flour**
 - **Multigrain**

5. We Have A Pediatric Problem

Mix up your choices within each food group.

	Focus on fruits. Eat a variety of fruits—whether fresh, frozen, canned, or dried—rather than fruit juice for most of your fruit choices. For a 2,000-calorie diet, you will need 2 cups of fruit each day (for example, 1 small banana, 1 large orange, and ¼ cup of dried apricots or peaches).
	Vary your veggies. Eat more dark green veggies, such as broccoli, kale, and other dark leafy greens; orange veggies, such as carrots, sweetpotatoes, pumpkin, and winter squash; and beans and peas, such as pinto beans, kidney beans, black beans, garbanzo beans, split peas, and lentils.
	Get your calcium-rich foods. Get 3 cups of low-fat or fat-free milk—or an equivalent amount of low-fat yogurt and/or low-fat cheese (1½ ounces of cheese equals 1 cup of milk)—every day. For kids aged 2 to 8, it's 2 cups of milk. If you don't or can't consume milk, choose lactose-free milk products and/or calcium-fortified foods and beverages.
	Make half your grains whole. Eat at least 3 ounces of whole-grain cereals, breads, crackers, rice, or pasta every day. One ounce is about 1 slice of bread, 1 cup of breakfast cereal, or ½ cup of cooked rice or pasta. Look to see that grains such as wheat, rice, oats, or corn are referred to as "whole" in the list of ingredients.
	Go lean with protein. Choose lean meats and poultry. Bake it, broil it, or grill it. And vary your protein choices—with more fish, beans, peas, nuts, and seeds.
Know the limits on fats, salt, and sugars. Read the Nutrition Facts label on foods. Look for foods low in saturated fats and <i>trans</i> fats. Choose and prepare foods and beverages with little salt (sodium) and/or added sugars (caloric sweeteners).	

US Dietary Guidelines

Focus on fruits.

Vary your veggies.

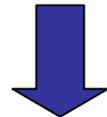
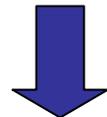
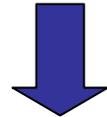
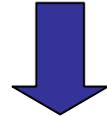
Get calcium-rich foods.

Make half your grains whole.

Go lean with protein.

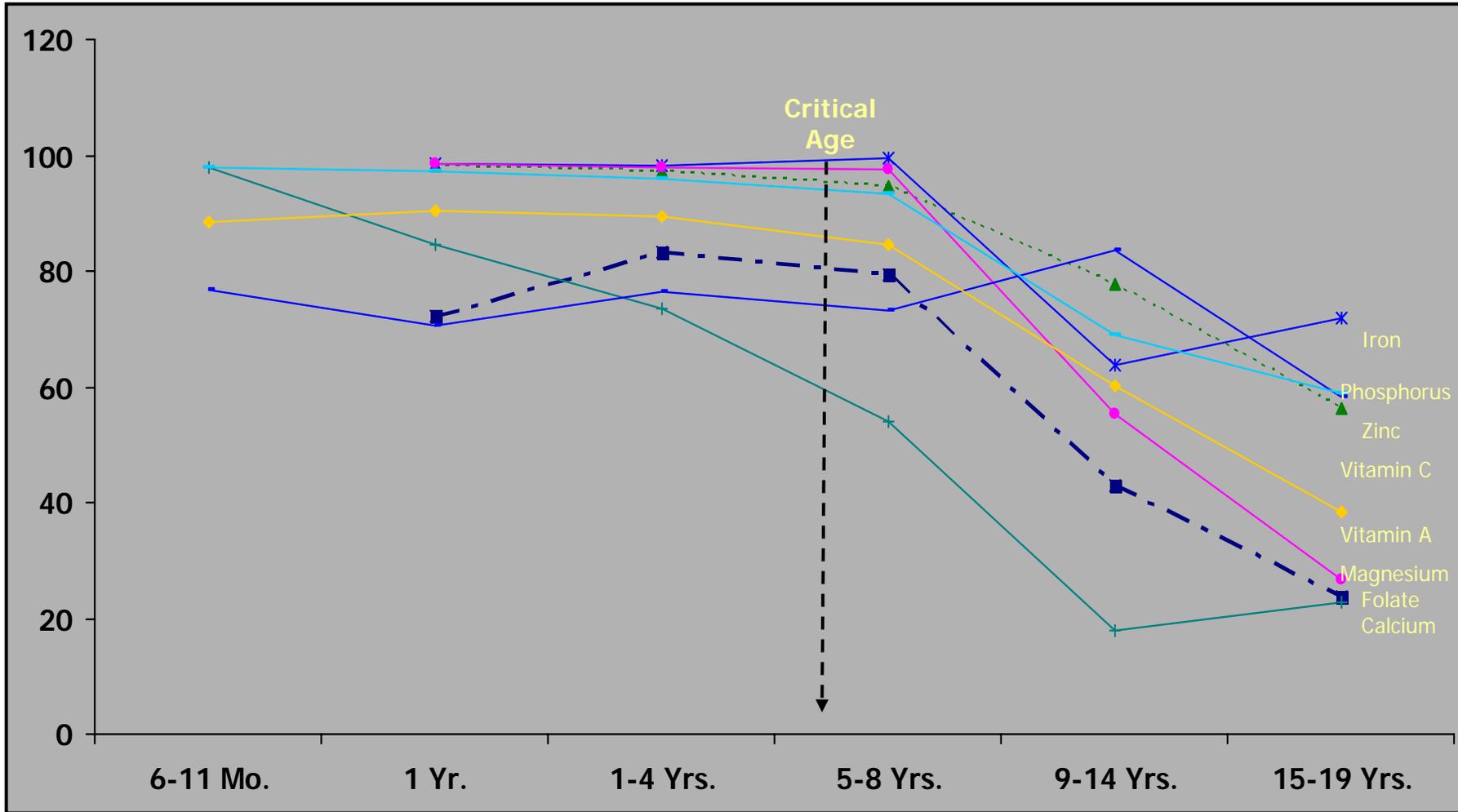
Know the limits on fats, salt, and sugars.

Current Children's Diet



% Children
Consuming
Daily
Recommended
Intake

Children are Overweight but Undernourished



Data compiled by Dr. John Lasekan, Ross Labs
from NHANES 1999-2000 and the Continuing Food Survey 1994-96, 1998

Early Nutrition

Women, Infants & Children Program

- 8.7 million participants/ month
 - 25% infants
 - 50% children to age 5 years
 - 25% pregnant and lactating females
- ***50% of all U.S. infants are on WIC***
- A more nutrient rich diet than non-WIC peers and equal to higher income infants

Missing Nutrients

High School Students

Males

- Vit A, Vit C, Vit E
- Magnesium, potassium
- Fiber
- Calcium

Females

- Vit A, Vit C, Vit E
- Magnesium, potassium
- Vit B-6
- Folate
- Thiamin
- Iron
- Phosphorous
- Zinc
- Fiber
- Calcium

#6. the problem

starts

in infancy

*From 12-24 months
the child assumes
the eating habits
of the family —*

*The Feeding Infants
And Toddlers Study*



Cereals

Infants & Toddlers

	Any Grain	Infant Cereal	Non-Sweet	Sweet Cereal	Cereal Bars
4-6 mo	65.8 %	64.8 %	0.5 %	0.0 %	0.0 %
7-8	91.5	81.2	17.0	1.8	1.1
9-11	97.5	63.8	37.0	9.0	3.4
12-14	97.8	23.9	44.5	17.7	9.8
15-18	98.6	9.2	40.6	26.4	10.0
19-24	99.2	3.1	31.9	22.7	9.7

What Infants & Toddlers Drink

	All milks	100% juice	Fruit drinks	Soft drinks	Water
4-6 mo	100 %	21.3 %	1.6 %	0.1 %	33.7 %
7-8	100	45.6	7.1	1.1	56.1
9-11	99.7	55.3	12.4	1.7	66.9
12-14	98.2	56.2	29.1	4.5	72.2
15-18	94.2	57.8	38.6	11.2	74.0
19-24	93.4	61.6	42.6	11.9	77.0

Desserts and Sweets

	Any Dessert	Baby Desserts	Cakes, pastries, cookies	Candy
4-6 mos	10.4 %	4.2 %	4.3 %	0.0
7-8	45.8	17.7	27.0	1.1 %
9-11	61.1	17.0	40.9	3.2
12-14	78.8	6.0	50.5	10.2
15-18	88.8	2.3	60.2	15.2
19-24	90.5	0.0	61.6	20.0

We Don't Promote Vegetables

Dark Green Vegetables
consumed by fewer than
10% of toddlers

Deep yellow vegetables
Fall from 39% at 9 mos
to 14% at 18 mos

- **Potatoes**
 - 4-6 mos 3.6%
 - 7-8 mos 12.4%
 - 9-11 mos 24.1%
 - 12-14 mos 33.2%
 - 15-18 mos 42.0%
 - 19-24 mos 40.6%
 - ***By 24 mos 25% of toddlers consumed fried potatoes on any study day***

Naturally Nutrient Rich

the basics of nutrition



#7. Snack Foods are Sabotaging Nutrition

- 
- **Snack foods, beverages = 30% of daily energy**
 - Total daily calories increased
 - Energy from carbohydrates increased
 - Energy from fat increased

 - ***Displace: Protein, fiber, vitamins, folate, calcium, magnesium, iron, zinc***

Kids & Snack Foods

Snack foods and drinks = 1/3 of daily calories

2/3 comes from added sugar

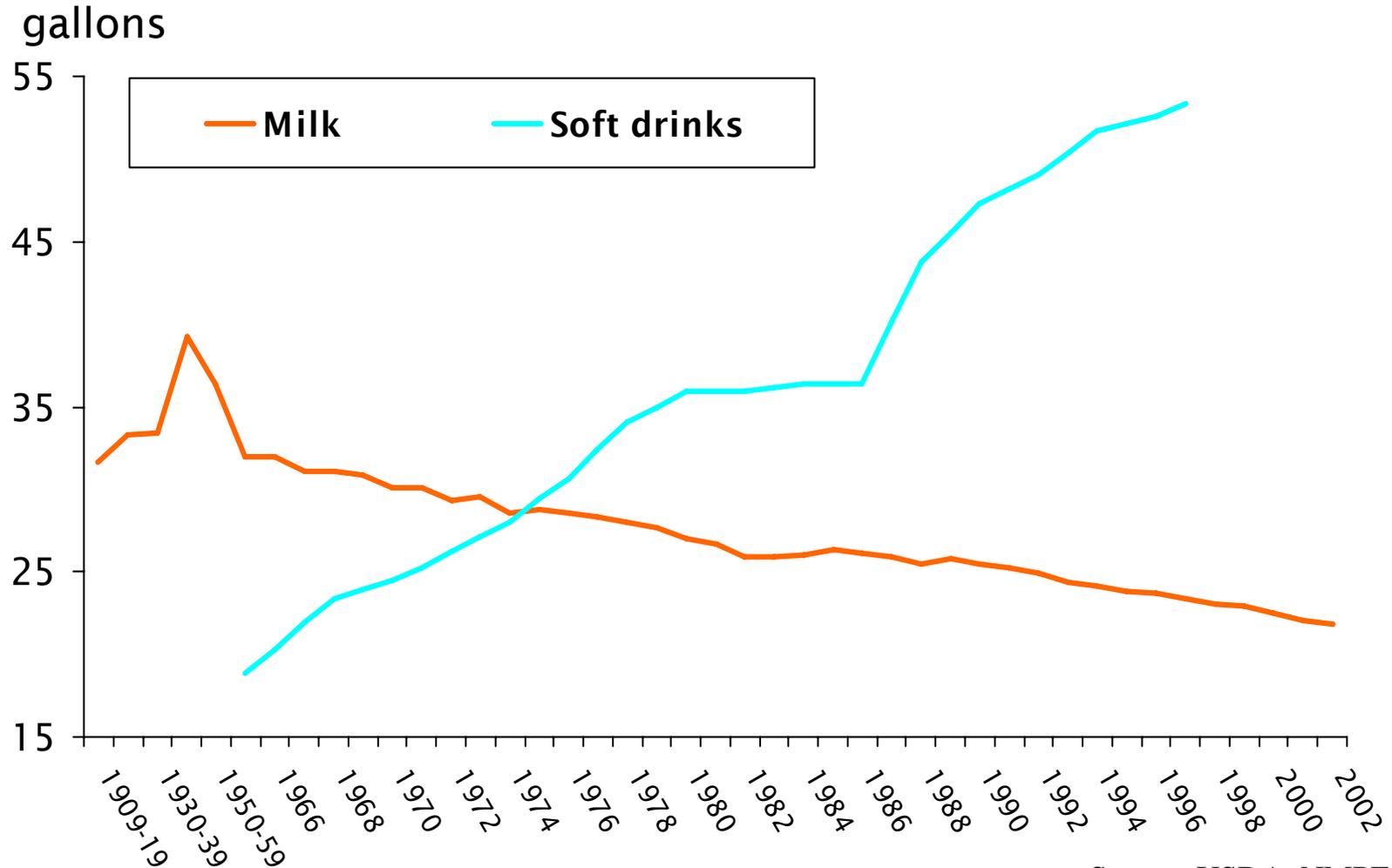
1/2 of sugar comes from sweetened drinks

which account for 10% of daily calories

Sweetened Beverages & 100% Juice

- **Consumption is rising**
 - 1988-94 242 kcal/day
 - 1999-2004 270 kcal/day
- **Rising fastest among**
 - 6-11 yr olds, Hispanics, African Americans
- **Energy/ day**
 - 148 kcal 2-5 yr olds
 - 136 kcal 6-11 yr olds
 - 184 kcal 12-19 yr olds
- ***Accounts for 10-15% of total daily calories***

PER CAPITA BEVERAGE CONSUMPTION



Source: USDA, NMPP

Sweet Drink's Nutrients

- Sugar (10 teaspoons)
- Water
- Caffeine
- Artificial Colors and Flavors
- 150 kcals/ 12 oz

Milk's Nutrients

- **Calcium (30% DV*)**
- **Potassium (11% DV)**
- **Phosphorus (20% DV)**
- **Protein (16% DV)**
- **Vitamin A (10% DV)**
- **Vitamin D (25% DV)**
- **Vitamin B12 (13% DV)**
- **Riboflavin (24% DV)**
- **Niacin (10% DV)**
- **90 kcal/ 8 oz**

More Snacks, More Calories

	Total	MALES	FEMALES
0 Snacks	11%	2156 kcal	1501 kcal
1 Snack	25%	2391 kcal	1812 kcal
2 Snacks	26%	2505 kcal	1944 kcal
3 Snacks	19%	2916 kcal	2136 kcal
4 Snacks	18%	3249 kcal	2437 kcal

“for teens GRAZING is the new norm”

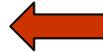
Snack's are Low Quality

<u>GROUP</u>	<u>SERVINGS</u>	<u>SNACKS</u>
Grains	22%	chips, puffs, breads, cookies
Vegetables	15%	potato chips, pizza, french fries
Fruits	39%	OJ, apples, non-citrus juices
Milk	24%	white, flavored, frozen dairy
Meat/beans	12%	hot dogs, lunch meats
Oils	37%	corn chips, puffs, potato chips
Solid fats	24%	frozen dairy, cookies, milk
Added sugars	43%	soft drinks, fruit drinks, candies
Discretionary	35%	soft drinks, frozen dairy, candies

**#8. *Our Consumer
Messaging
about Nutrition
is Wrong.***

“Avoidance” Messaging

Nutrition Facts	
Serving Size 1 bar (35g) Servings Per Container 1	
Amount Per Serving	
Calories 140	Calories from Fat 45
% Daily Value*	
Total Fat 5g	8%
Saturated Fat 3.5g	18%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 150mg	6%
Total Carbohydrate 15g	5%
Dietary Fiber 3g	
Sugars 7g	
Protein 10g	20%
Vitamin A	15%
Vitamin C	0%
Calcium	15%
Iron	10%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g



Has created
a dangerous
misperception:

Fewer “bad” nutrients =
a nutritious product

Less fat, fewer calories, but not more nutrients



Nutrition Facts	
Serving Size 1 oz.	
Amount Per Serving	
Calories 150	Calories from Fat 90
% Daily Value*	
Total Fat 10g	16%
Saturated Fat 1g	6%
Polyunsaturated Fat 4.5g	
Monounsaturated Fat 4.5g	
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 180mg	7%
Potassium 330mg	9%
Total Carbohydrate 15g	5%
Dietary Fiber 1g	4%
Sugars 0g	
Protein 2g	
Vitamin A 0%	Vitamin C 10%
Calcium 0%	Iron 2%
Vitamin E 6%	Thiamin 2%
Niacin 6%	Vitamin B ₆ 4%
Phosphorus 4%	Magnesium 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Potassium	3,500mg 3,500mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 Protein 4

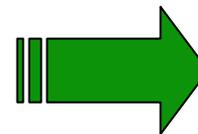
Ingredients: Potatoes, Sunflower Oil and/or Corn Oil, and Salt.
No Preservatives.



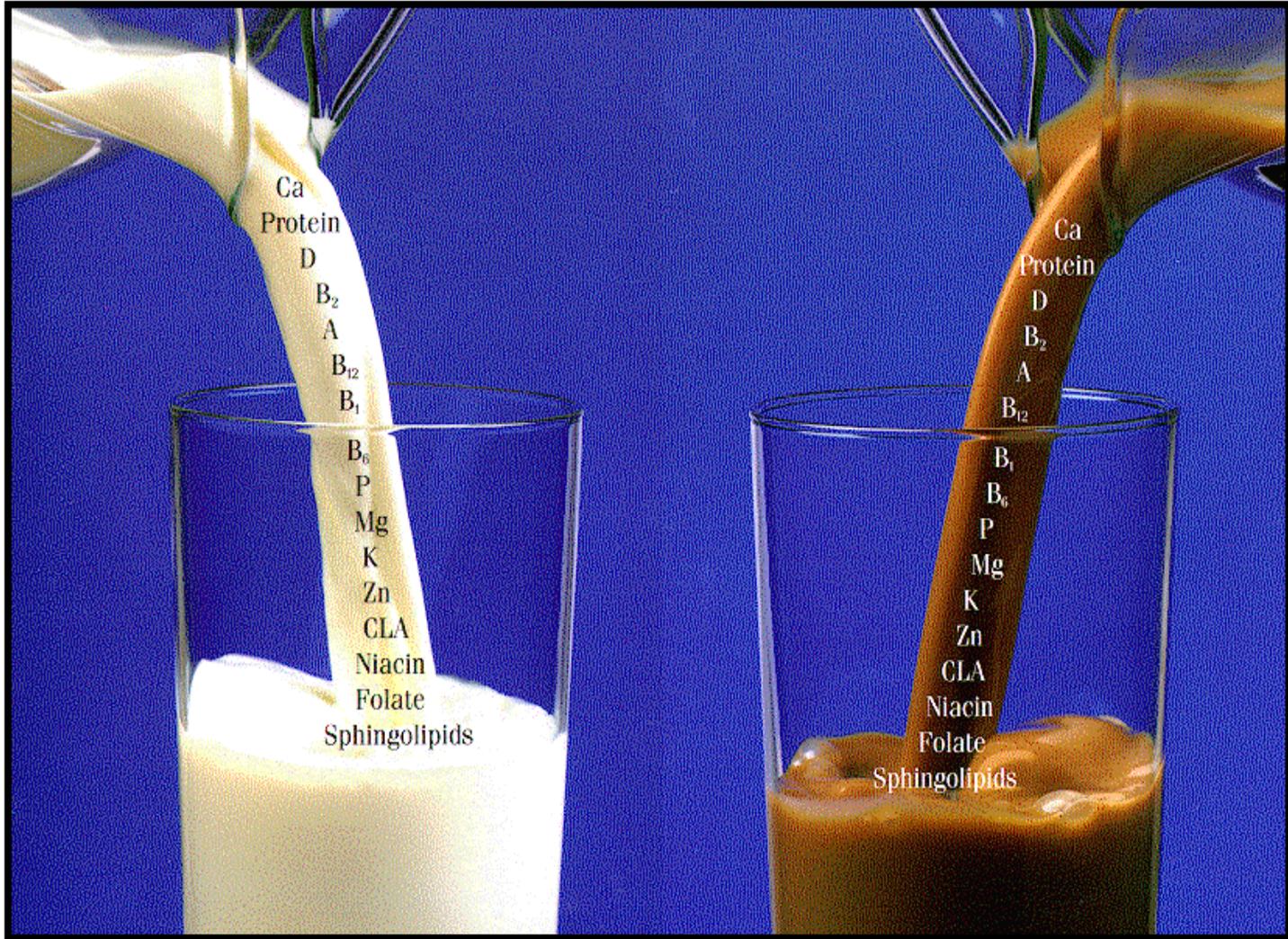
Nutrition Facts	
Serving Size 1 oz. (28g/About 11 crisps)	
Servings Per Container 10	
Amount Per Serving	
Calories 110	Calories from Fat 15
% Daily Value*	
Total Fat 1.5g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 150mg	6%
Total Carbohydrate 23g	8%
Dietary Fiber 2g	6%
Sugars 2g	
Protein 2g	
Vitamin A 0%	Vitamin C 2%
Calcium 4%	Iron 2%
Thiamin 4%	Niacin 6%
Vitamin B ₆ 4%	Phosphorus 8%
Zinc 2%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 Protein 4

Ingredients: Dehydrated Potatoes, Modified Food Starch, Sugar, Corn Oil, Salt, Soy Lecithin, Leavening (Monocalcium Phosphate and Sodium Bicarbonate), and Dextrose.

Does it merit this?

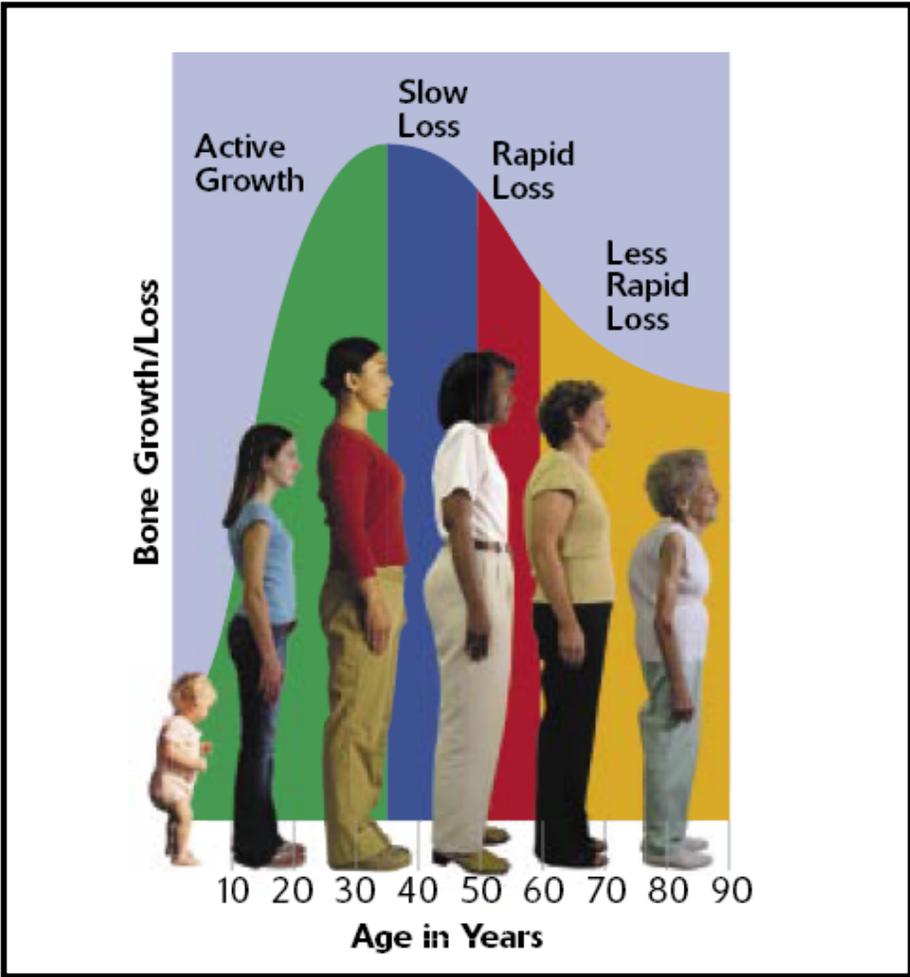


The Baby with the Bathwater?

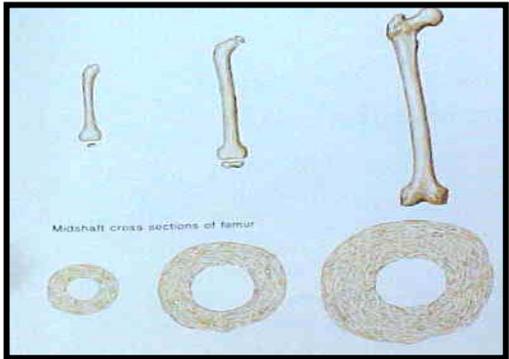
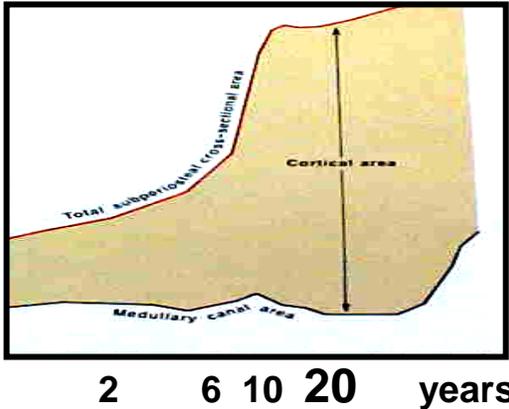


Calcium & Bone

Bone Grows Most in Teens



Bone Thickness



1 m 2 y 18 y

BUT

Kids Don't Get Enough
Calcium

<u>Age</u>	<u>Male</u>	<u>Female</u>
6-11 y	44%	58%
12-19 y	64%	87%
>20 y	55%	78%

#9. Breakfast is Crucial

Vanishing Breakfast

- Preschool: 95%
- 8-10 yo: 91%
- Teens: 85%

- High school:
 - All: skip 3 x/ week
 - Girls: 1 of 3 skips daily
- Lowest: HS girls, low SES, Blacks & Hispanics

**“I gave up breakfast
because it makes me fat.”**

Wrong answer.

Breakfast & Body Weight

Studies in children and adolescents show a link between regular breakfast and lower BMI

- **Skippers: twice as likely to be overweight**
- **Overweight are more likely to skip**
- **Similar data for males and females**

A Paradox: BF eaters consume more energy per day yet are less likely to be overweight

What is the Ideal Breakfast?

- **25% of daily energy**
- **All 3 macronutrients**
- **Sugars and fats drive nutrients**
- **Whole grain cereals, breads, nuts & seeds**
- **Low-fat milk and yogurt**
- **Fruit and/ or 100% fruit juice**
- **and often... *Grab-n-Go***

Ready-to-Eat Cereal

- 92% fortified with essential nutrients
- Over 90% consumed with milk
- Opportunity for whole grains, fiber
- Lower daily fat, sat fat & cholesterol
- Improves “problem” nutrients:
 - Vit A, B-6, B-12, Vit C
 - Calcium, iron
 - magnesium, phosphorous

Associated with lower BMI

Breakfast & Cognitive Performance

- Improves matching familiar figures (MMF), math, word recall, short term memory tests
- Improves spatial memory
- Improves mood, anxiety & irritability
- Strong subjective sense of physical and mental well-being
- *An all morning effect*

Breakfast & Mood

- BF increases alertness
- Fiber & carbs ideal
- High carb, low fat BF improved mood *better than* high fat, low carb BF
- **Skipped energy at BF is *not* made up -- hunger, preoccupation with food and food cravings linger -- *even at day's end***

#10. Diets don't work. Do they?

The DASH Diet Does!

- **D**ietary **A**pproaches to **S**top **H**ypertension
- **Lowers BP, stroke, heart disease, weight**
- **Focus:** Veggies, fruits, low fat milk/ dairy, whole grains, fiber, nuts, fish, poultry
- **Limits:** sodium, red meat, sweets, sugars

Which is where we started ...

<http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/>



Emphasize Diet Quality

NOT DIETS



THINGS ABOUT NUTRITION

- Gold Standard = US Dietary Guidelines
- *Activity* = Calories
- Nutrient Rich Foods
- Whole Grains are healthy
- Nutrition is a Pediatric Problem
- The Problem Starts in Infancy
- Snacks are Sinking Pediatric Nutrition
- Nutrition Messaging is Wrong-Headed
- Breakfast is Crucial to quality nutrition
- *And...*the DASH Diet Works!

Obesity and Schools:

Nutrition & Physical Activity



Competitive Foods

HEALTHY
FOOD
ZONE



A la Carte Sales
School Parties
Fundraisers
School Stores
Vending
Boosters
Athletics
Student Clubs

Versus

The Federally
Regulated
School Meal
Program

School Policy

- A Wellness Advisory Council
- Nutrition and Physical Education
- Physical Activity
- School meals
- Vending, contracts & a la carte
- Curriculum



*Obesity prevention
within schools is critical*

Coordinated School Health 8 component Model





Introducing: Fuel Up to Play 60

*Students Leading the Way to
Eating Healthier and Moving More*



©2009 National Dairy Council® Fuel Up is a service mark of National Dairy Council.
©2009 NFL Properties LLC. Team names/logos are trademarks of the teams indicated. All other NFL-related trademarks are trademarks of the National Football League.



Program Looks to Students for its Success

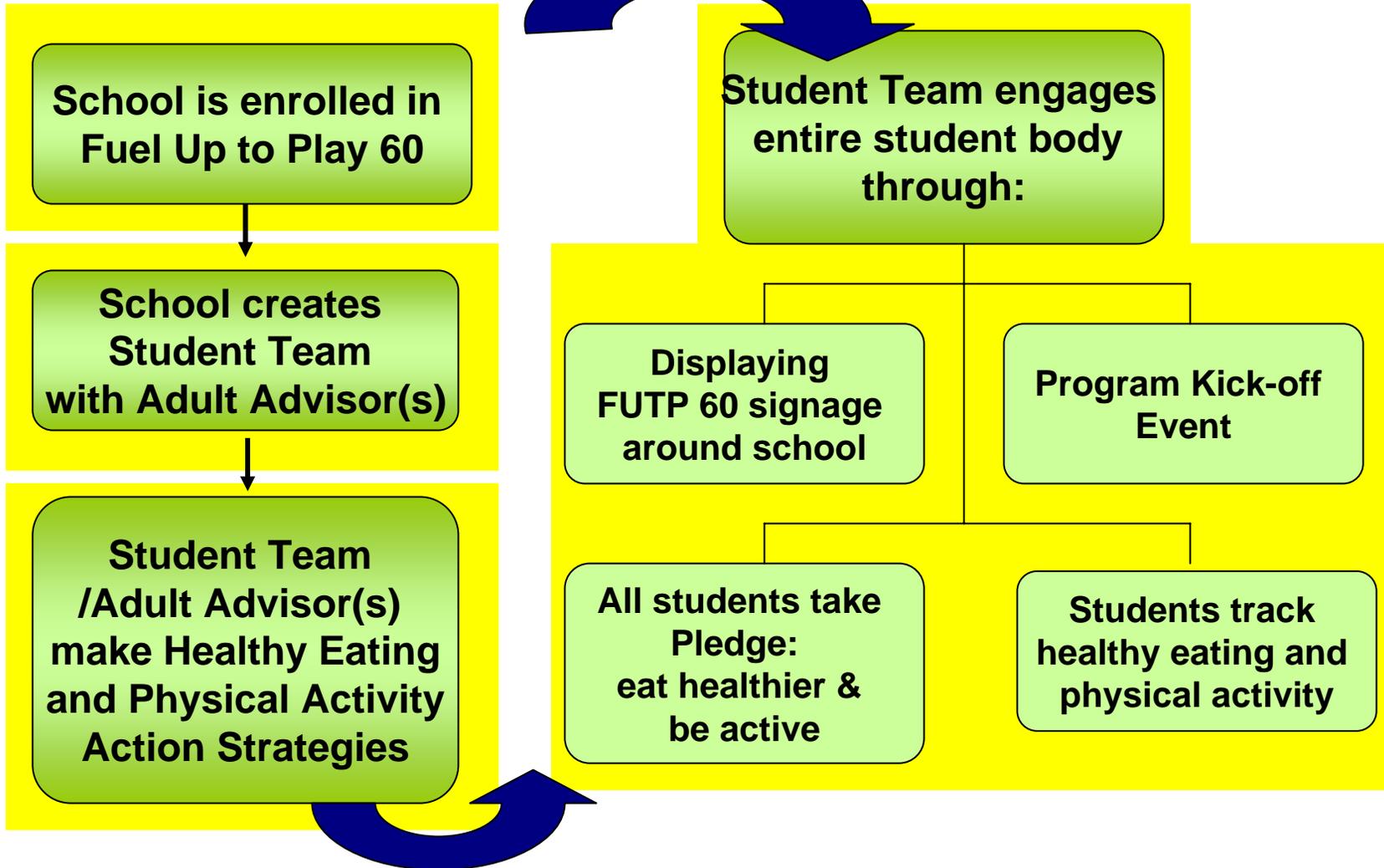
Students lead the effort

Partnering with adult stakeholders

**Work toward positive, long-term changes
in the school's wellness environment.**

How Fuel Up to Play 60

Works





= Improving student and school wellness by encouraging healthy eating and physical activity



©2009 National Dairy Council® Fuel Up is a service mark of National Dairy Council.
©2009 NFL Properties LLC. Team names/logos are trademarks of the teams indicated. All other NFL-related trademarks are trademarks of the National Football League.



Fuel Up to Play 60



**Low-fat /
fat-free dairy foods**



Whole grains

Nutrition Goal:
**Increase access &
consumption of foods
kids don't get enough of.**



Fruits



Vegetables

Fuel Up to Play 60

Physical activity goal:



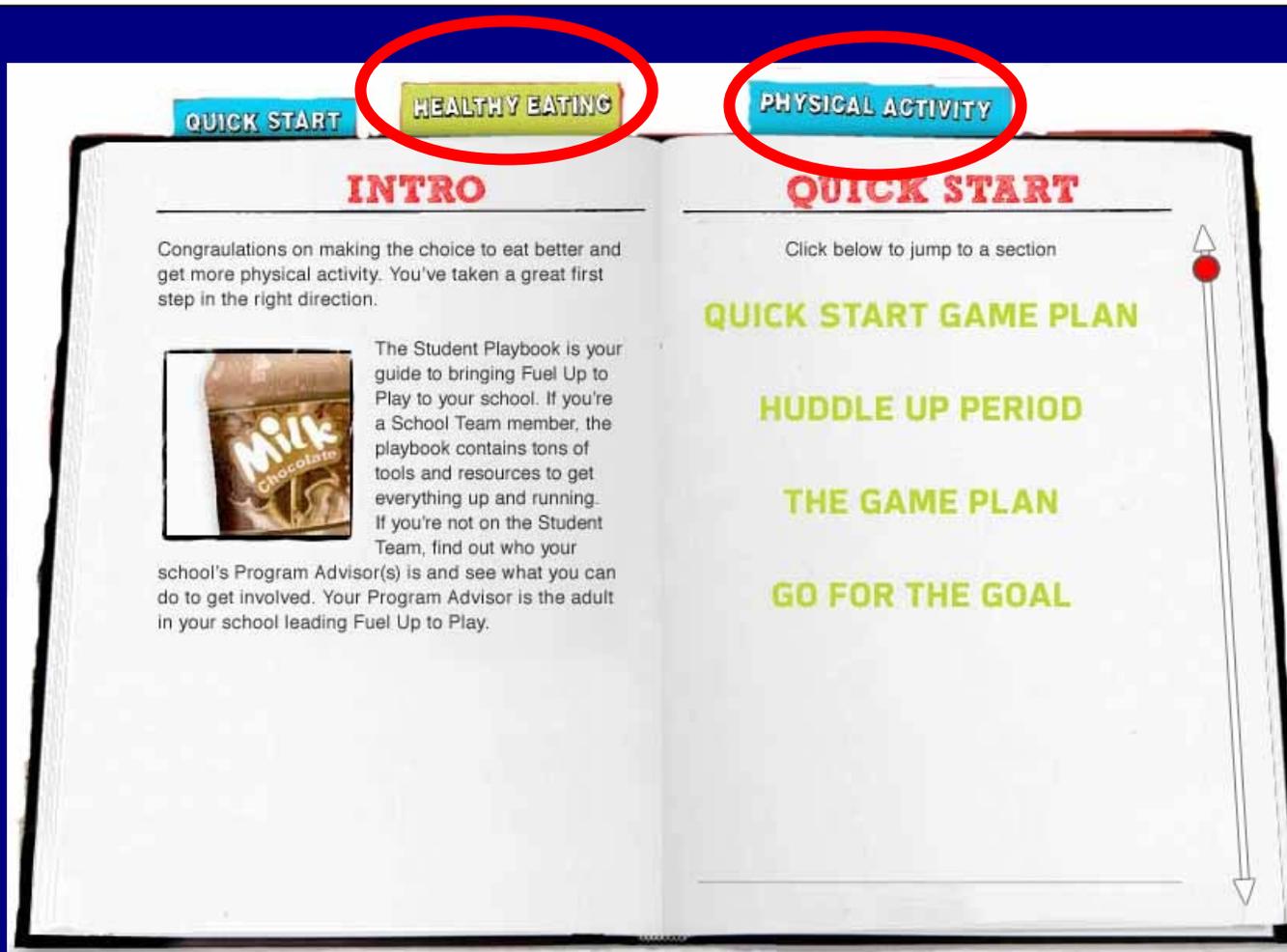
**Be physically active for 60 minutes a day, every day -
before during and after school**

Key Program Elements



Display Materials

Key Program Elements



Fuel Up to Play 60 Playbook

Key Program Elements

Tracking Progress



Personal Pledge

Pledge

Lead the Way and Join Fuel Up to Play 60!

Fuel: I will energize my body and mind by eating healthy.

Play: I will be active for 60 minutes each day.

Fuel Up to Play 60: I will eat healthy, be active and have fun with my friends to help make my school an even better place.

I pledge to Fuel Up to Play 60 by:

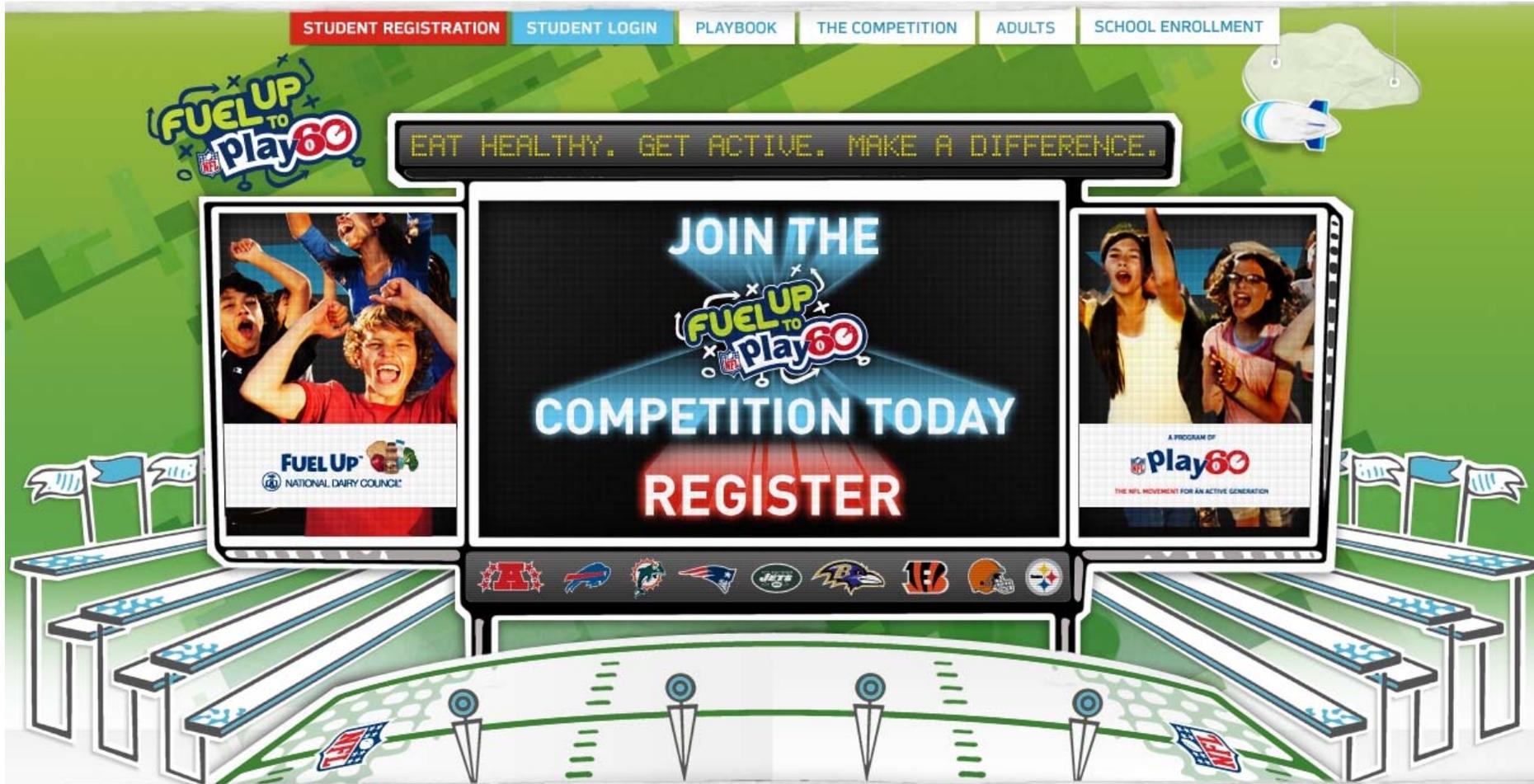
your own ideas on how you will eat healthy and get active for 60 minutes every day. For example, have an apple with your lunch or a glass of low-fat milk with dinner, ride your bike to school or throw a football with your friends - it's up to you!

FUEL UP TO PLAY 60

A PARTNER OF **play60**

www.fueluptoplay60.com

Key Program Elements



Get Started!

Ready to *Fuel Up to Play 60?*

www.FuelUpToPlay60.com

Questions:

Call UDIM at 1-800-241-MILK