

Feet, forks, & the fate of children

David L. Katz, MD, MPH, FACPM, FACP

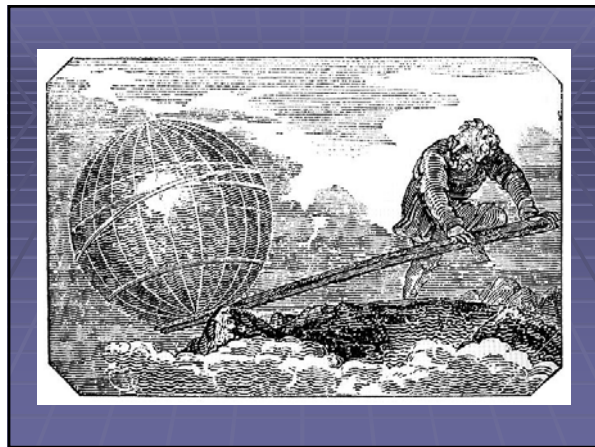
Director, Prevention Research Center
Yale University School of Medicine

President & Founder, *Turn the Tide Foundation, Inc.*



John Stalker Institute
Marlborough, MA
4-7-09

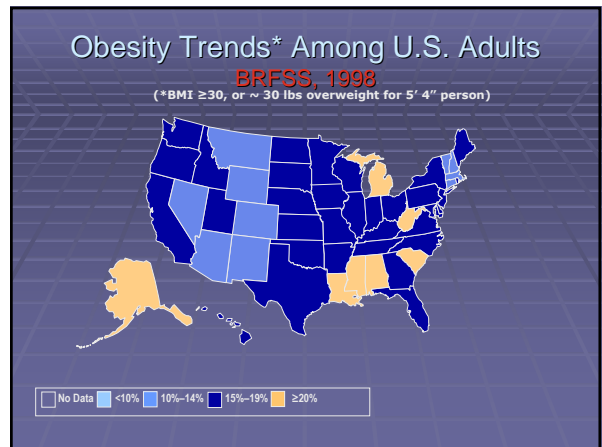
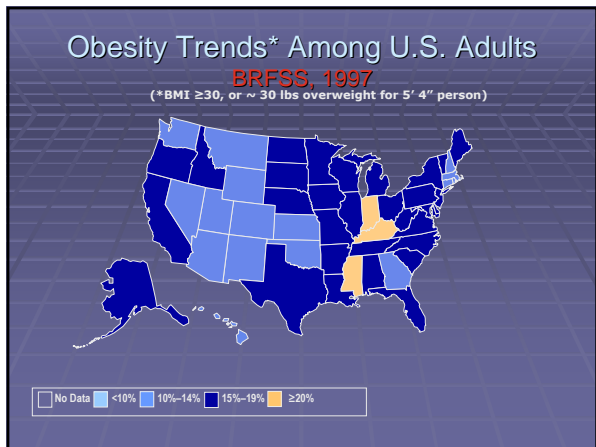
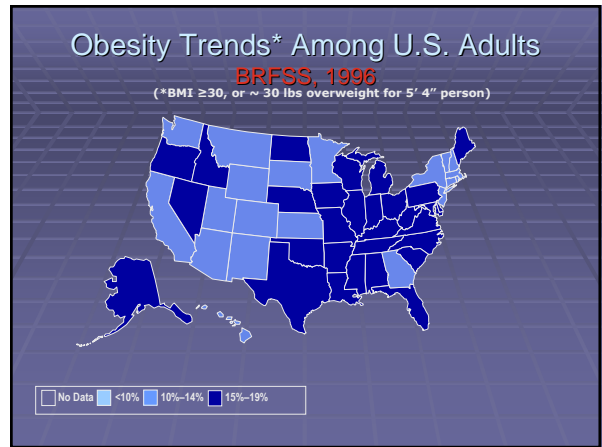
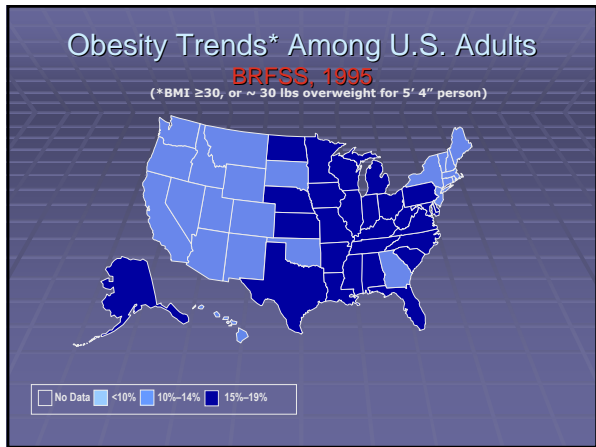
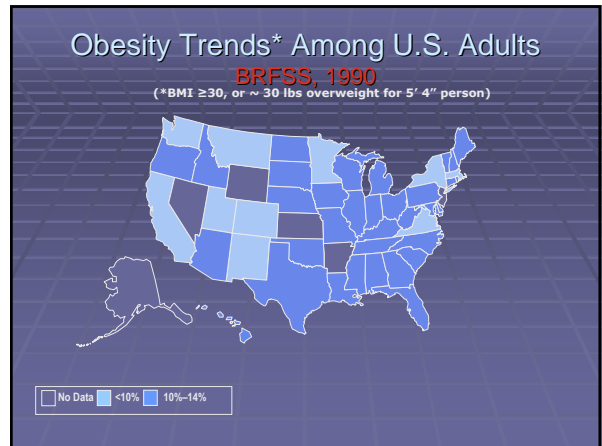
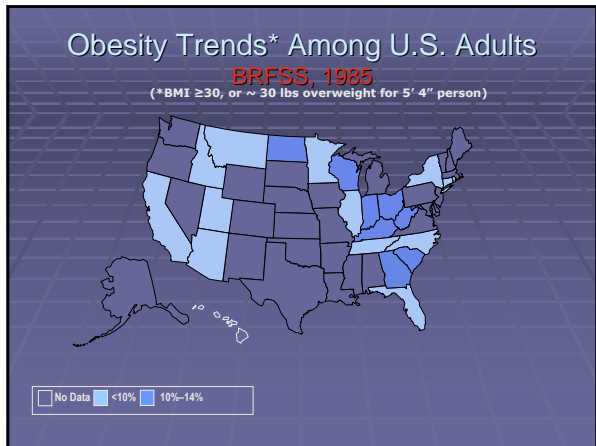


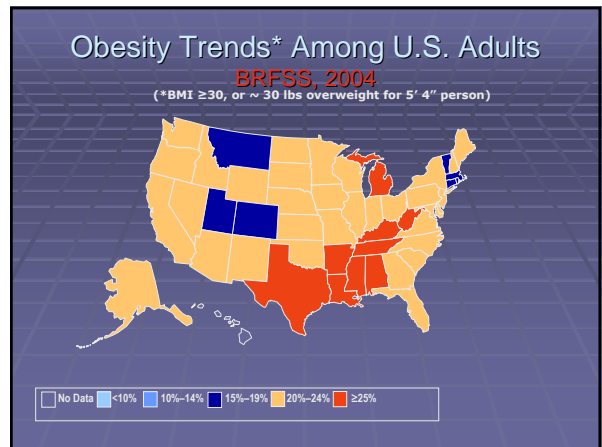
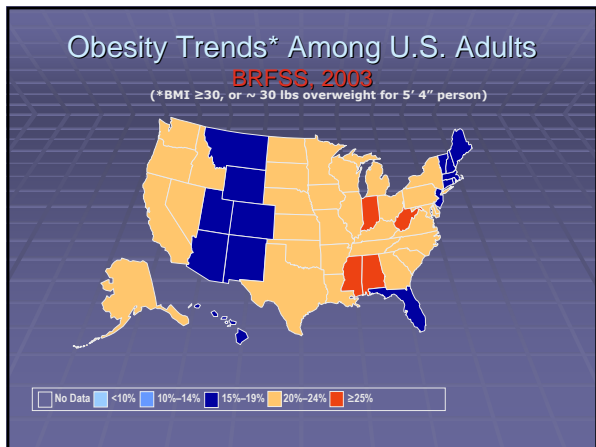
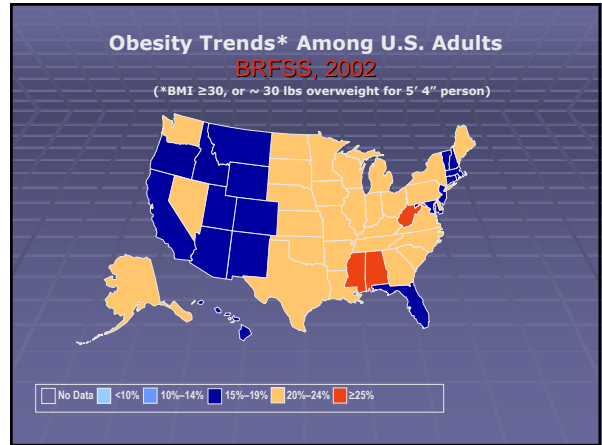
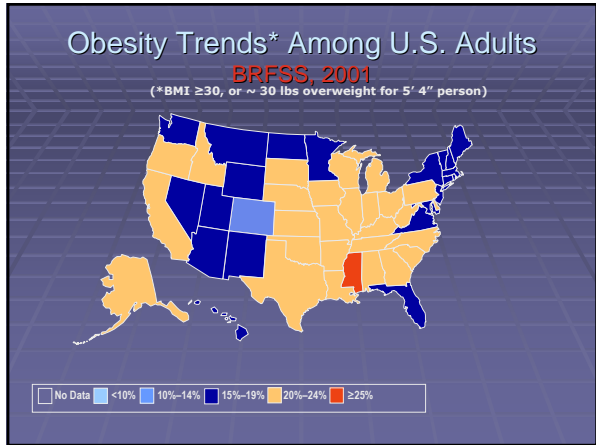
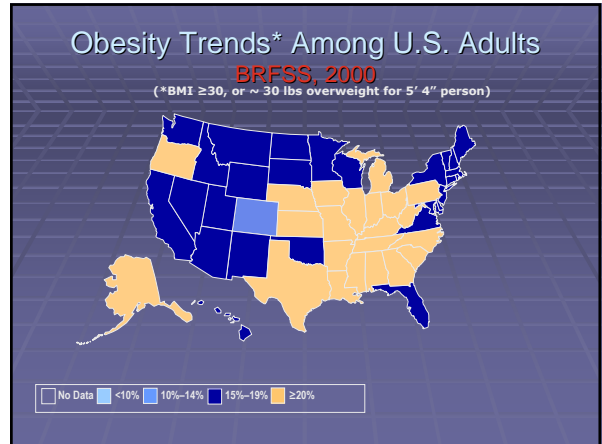
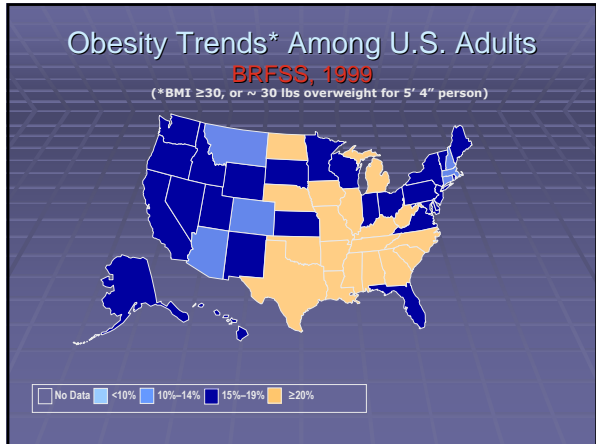


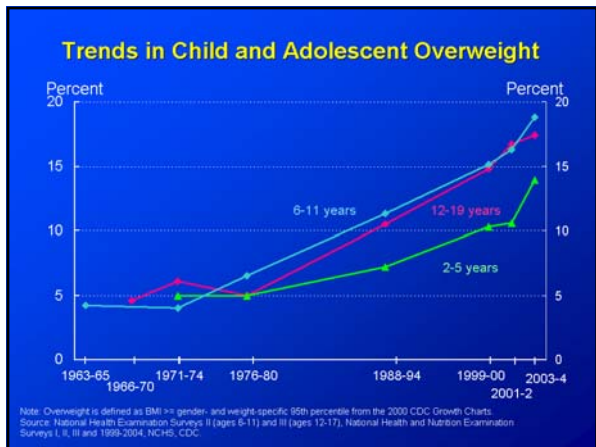
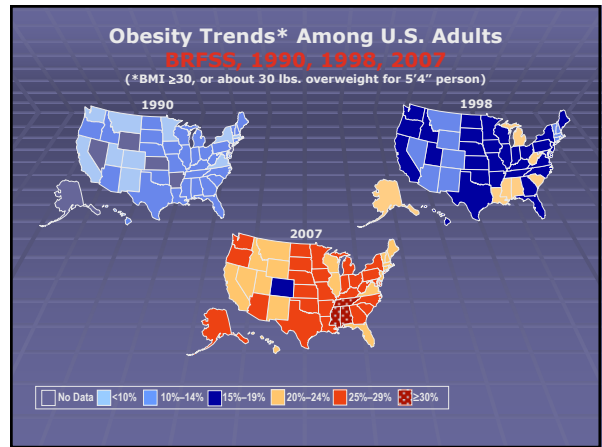
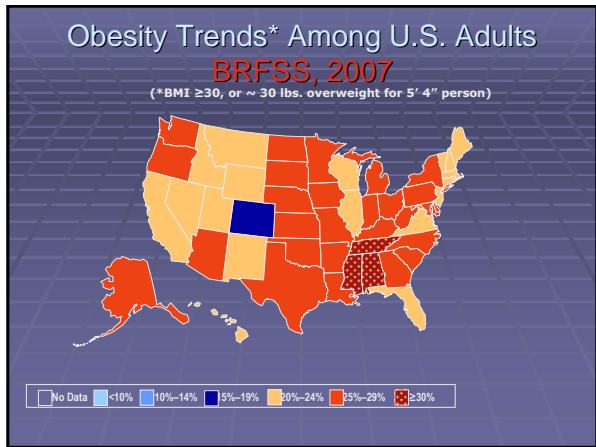
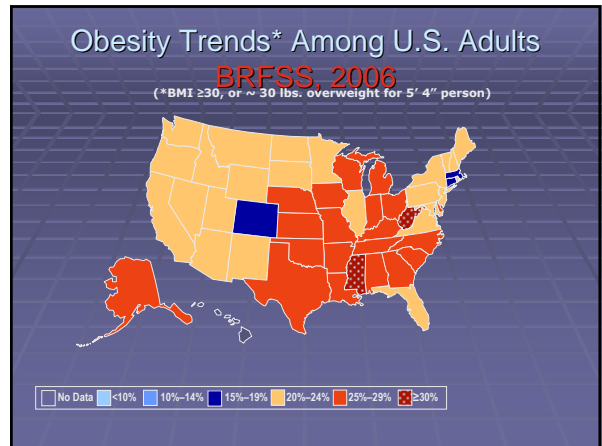
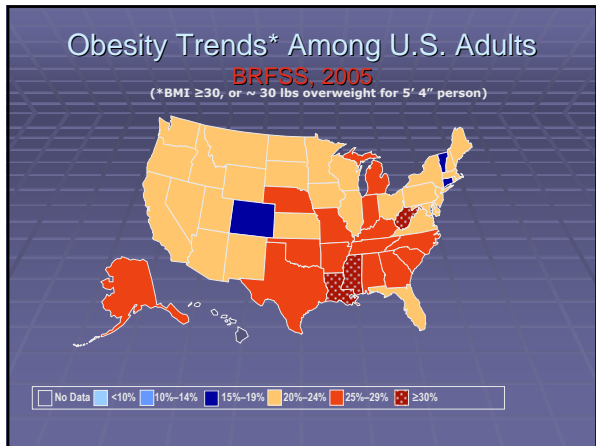
And now, in slightly greater detail-

- *What?*
- *Why?*
- *How?*
 - *Science, sense...& sandbags*
- *Who, & when-*
 - *If not us...*
 - *Us, in historical perspective*

*What...
a mess-*





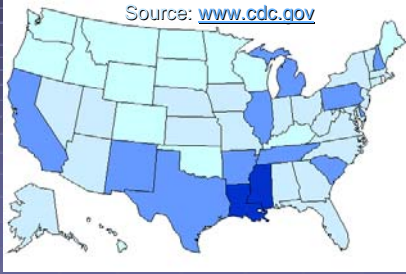


Obesity Portends Diabetes...

Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

BRFSS 1994

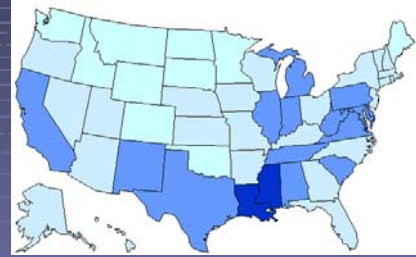
Source: www.cdc.gov



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5-5.9% 6+ %

Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

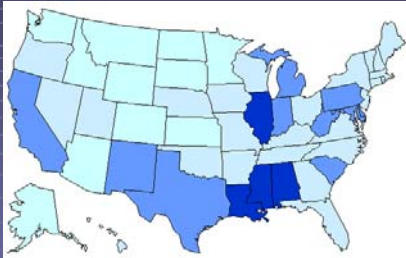
BRFSS 1995



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

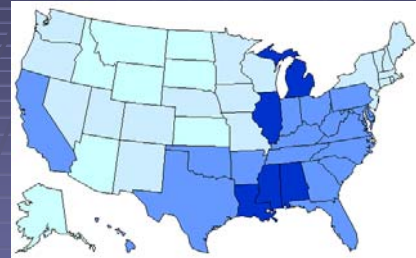
BRFSS 1996



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

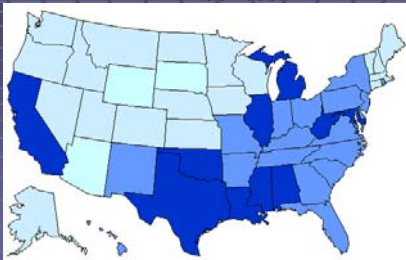
BRFSS 1997



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

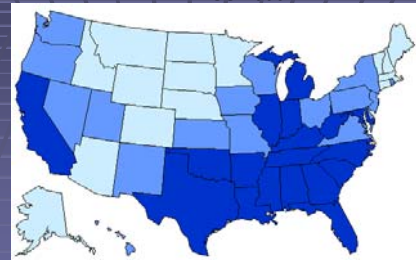
BRFSS 1998



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

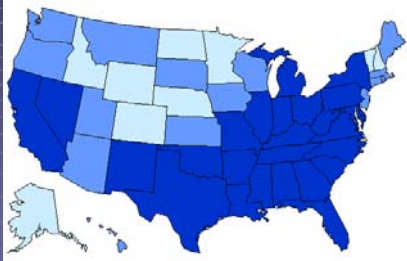
BRFSS 1999



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

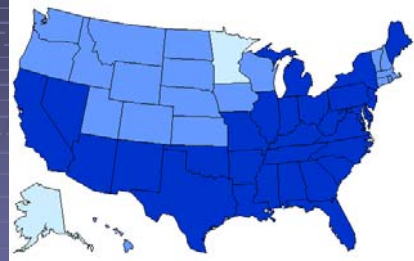
BRFSS 2000



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

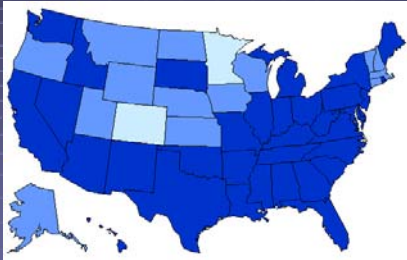
BRFSS 2001



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

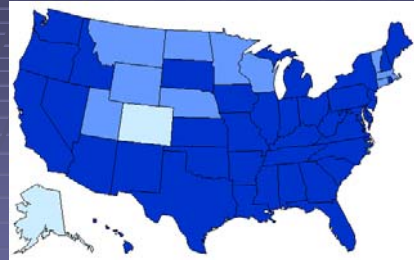
BRFSS 2002



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

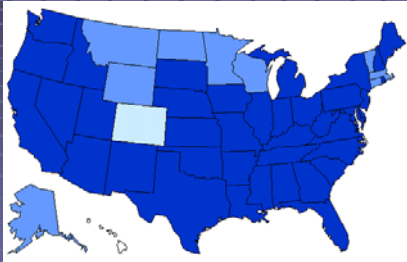
BRFSS 2003



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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

BRFSS 2004

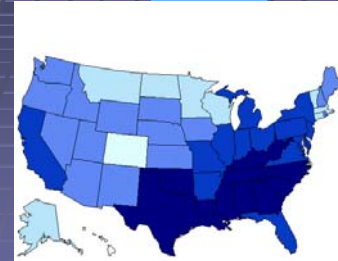


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Diabetes Trends* Among Adults in the U.S.
(Includes Gestational Diabetes)

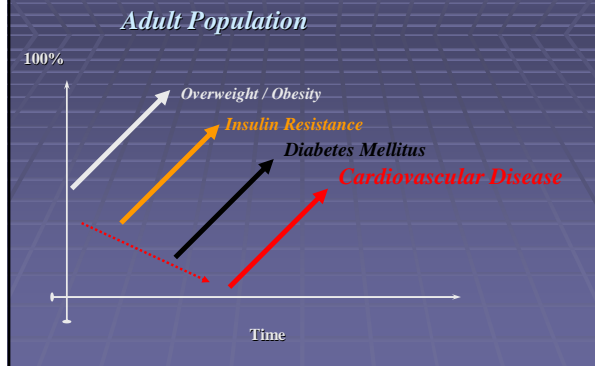
BRFSS 2005

Source: www.cdc.gov

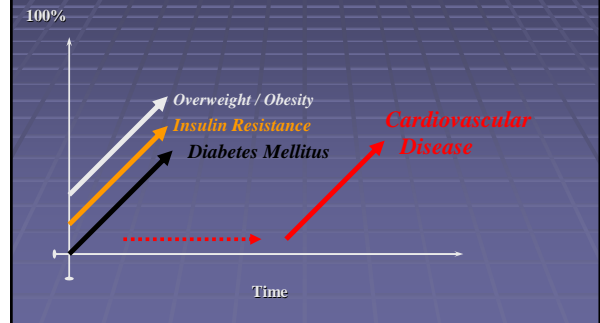


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6-6.9% 7-7.9% 8+ %

The mess we're in...



And the mess our children WILL be in...



And so, inevitably-

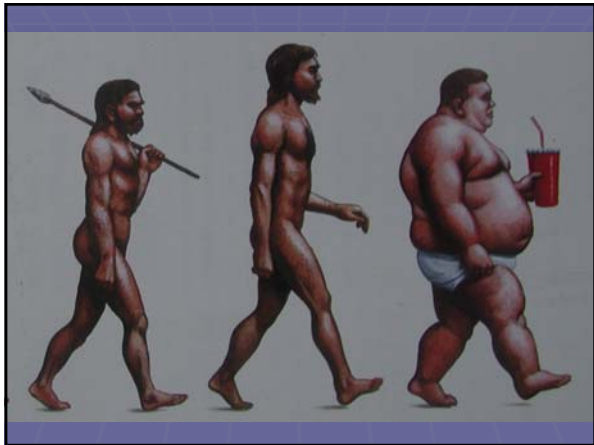
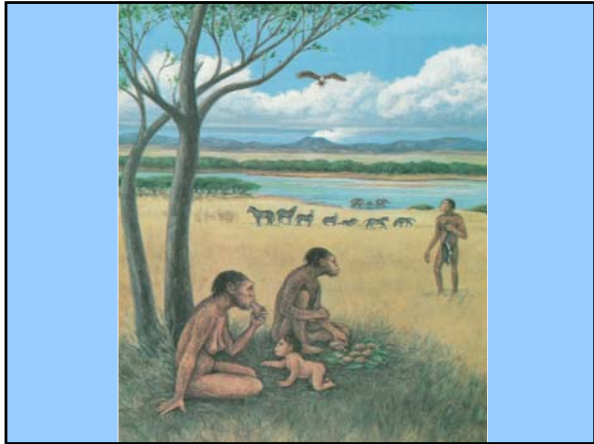
- Prospective Studies Collaboration. **Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies.** *Lancet*. 2009 Mar 17. [Epub ahead of print]

Why...

...are we
"eating ourselves to death" !?!

BECAUSE WE CAN!

The nature of our trouble,
the trouble in our nature...



How

...do we fix this mess?

Read the Writing on the Wall-

The New York Times
nytimes.com

- **November 12, 2008**
- Child Obesity Seen as Warning of Heart Disease
 - By [PAM BELLUCK](#)
- NEW ORLEANS — A new study finds striking evidence that children who are obese or have high [cholesterol](#) show early warning signs of heart disease.

Realize that there is **Lifestyle...**
and everything else

- McGinnis JM, Foege WH. Actual causes of death in the United States. JAMA. 1993;270:2207-12
- Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. JAMA. 2004;291:1238-45

Recognize the actual causes of causes...

- of both troubles, and cures-
 - Strong K, Mathers C, Leeder S, Beaglehole R. [Preventing chronic diseases: how many lives can we save?](#) Lancet. 2005 Oct 29-Nov 4;366(9496):1578-82
 - Epping-Jordan JE, Galea G, Tukuitonga C, Beaglehole R. [Preventing chronic diseases: taking stepwise action.](#) Lancet. 2005 Nov 5;366(9497):1667-71

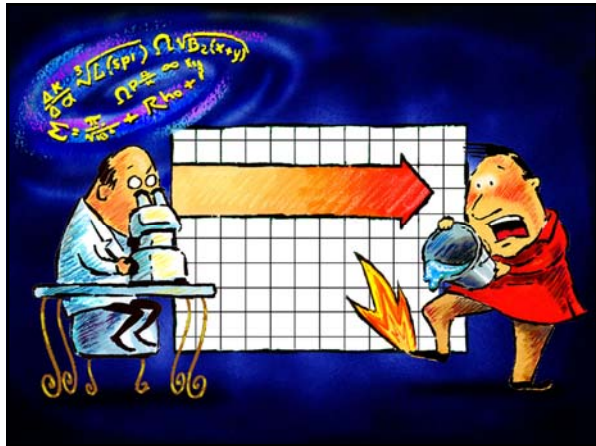
Respect **what lifestyle can do...**

- 80% reduction in heart disease
- 90% reduction in diabetes
- 60% reduction in cancer
 - and so on...

Katz DL. Nutrition in Clinical Practice, 2nd Edition, 2008

And renounce-

- Superfluous complexity...

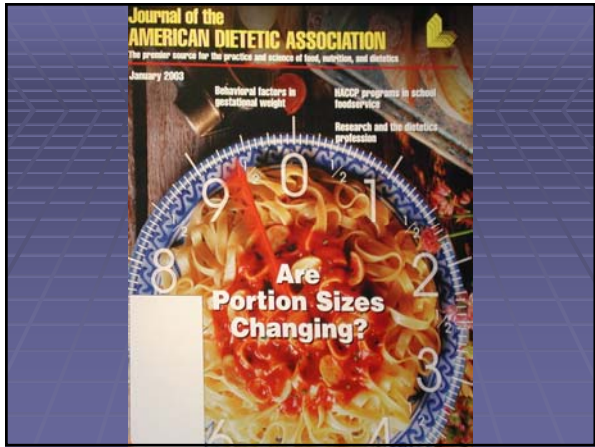


Causes of Obesity & Chronic Disease? **Complex Simplicity...**

- energy imbalance: calories in, calories out!
 - basal metabolism
 - postprandial thermogenesis
 - physical activity
- genetic factors
 - metabolic syndrome
 - Ob gene
 - neurohormonal regulation (e.g., neuropeptide Y, adiponectin, PYY, ghrelin, resistin, etc.)
 - basal metabolic rate (Pima Indians)
 - FTO polymorphisms
- Hypertrophic vs. hyperplastic obesity
 - metabolic set-point
 - the weight loss plateau

Too many calories in...

- 3900 calories produced in US each day for every man, woman, and child (www.usda.gov); something has to be done with them all!
- Nielsen SJ, Popkin BM. Pattern and Trends in Food Portion Sizes, 1977-1998. *JAMA*. 2003;289:450-453



...too few calories out.

 A cartoon illustration of a large, round, brown object, possibly a piece of meat or a vegetable, with a blue cloth draped over its top and sides. The object has a somewhat sad or weary expression.

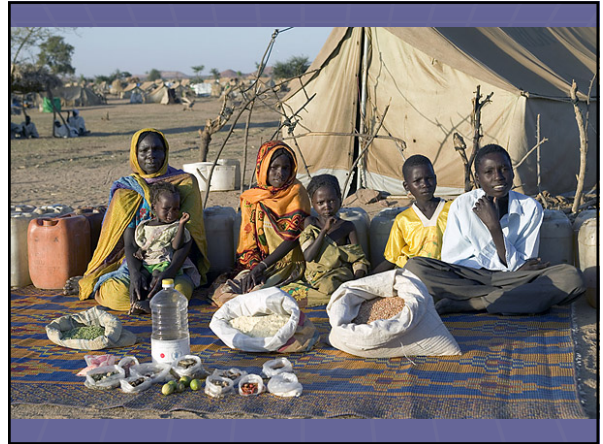

Or, in other words:

- “Eat food, not too much, **mostly plants***.”

- Michael Pollan

*in case confirmation were required, we just got it:

- Sinha R et al. Meat Intake and Mortality. A prospective study of over half a million people. *Arch Intern Med.* 2009;169(6):562-571



So it should be clear where “**there**” is.

But it may seem...

- you can't get there from **here**:



*The falsely alluring alternatives
to eating well...*

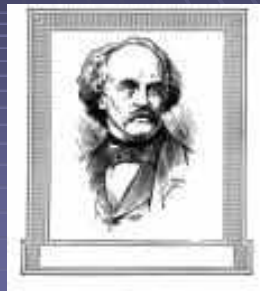
Pharmacotherapeutic Phantasies
& Cold Hard Steel-

- **EU suspends sales of rimonabant: 10/24/08**
- **Tesofensine shows promise, but...**
 - Astrup A, Madsbad S, Breum L, Jensen TJ, Kroustrup JP, Larsen TM. Effect of tesofensine on bodyweight loss, body composition, and quality of life in obese patients: a randomised, double-blind, placebo-controlled trial. *Lancet*. 2008 Oct 22. [Epub ahead of print]
- **Obesity Surgery Increases by 600 Percent**
 - *Safer Techniques, More Insurance Coverage and Celebrity Patients Make It More Appealing*. ABC News Medical Unit, May 31, 2006

Beware our Birthmark...

- Like Hawthorne's hapless heroine, we all are marked from birth...

- Katz DL. The Scarlet Burger. *Wall Street Journal*, Op-Ed. 11/19/03



Gene “complex” ... *no kidding!*

- Emilsson V et al. Genetics of gene expression and its effect on disease. *Nature*. 2008 Mar 16; [Epub ahead of print] PMID: 18344981

Apply **skill** power,

- not just will power.

Or in other words...

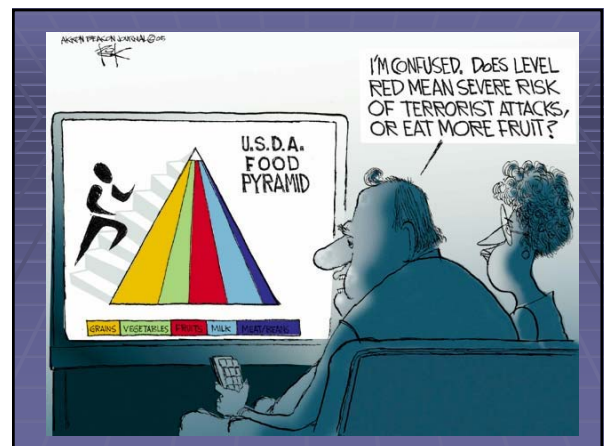
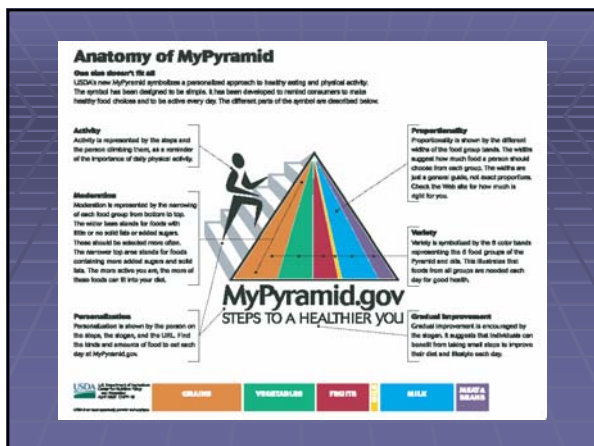
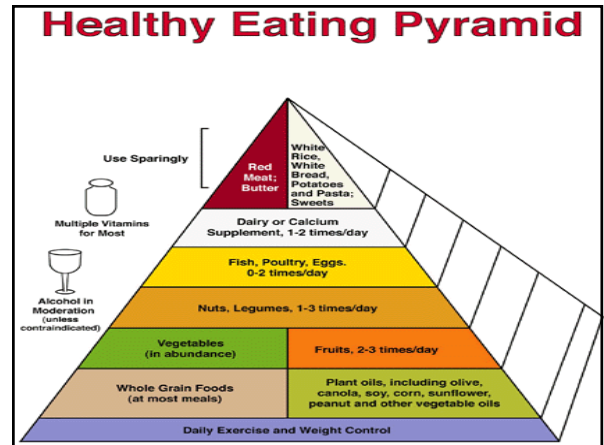
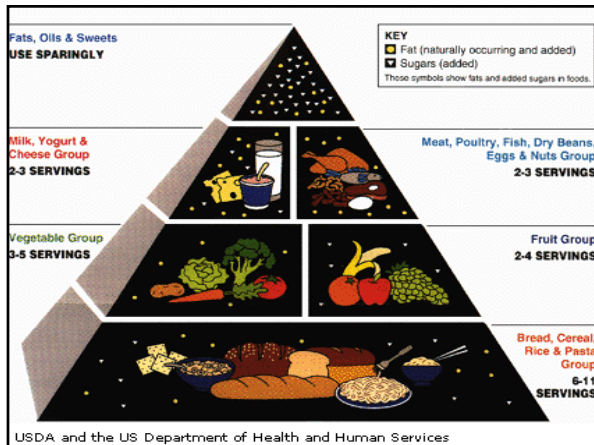
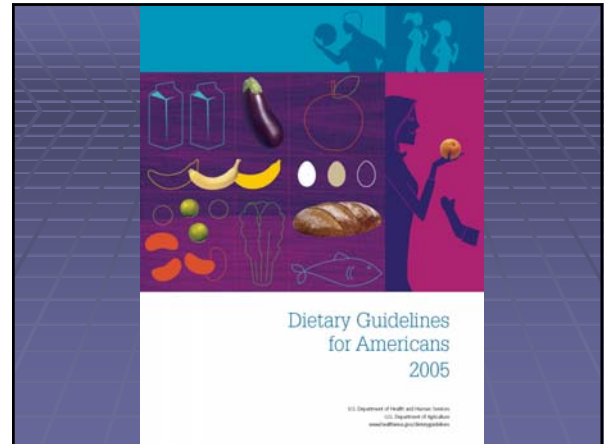




For starters, getting unbefuddled...

Newsweek Cover: 3/7/06

Newsweek
Diet Hype
Confused? From Fat to Calorie,
How the Media Confuses With Science





Recipe for Reconciliations: *A dash of dietary Darwinism...*

- Eaton SB, et al. **Evolutionary Health Promotion**. *Prev Med*. 2002;34:109-118
- Eaton SB, Eaton SB III, Konner MJ. **Paleolithic nutrition** revisited: A twelve-year retrospective on its nature and implications. *Eur J Clin Nutr*. 1997;51:207-216
- Lev-Ran A. **Human obesity: an evolutionary approach** to understanding our bulging waistline. *Diabetes Metab Res Rev*. 2001;17:347-62

Along with a *dash* of...

- ...**DASH**, a pat of **PREMIER**, a pinch of the **DPP**, & a smidgen of the **NWCR**
 - Sacks FM et al. *N Engl J Med*. 2001;344:3-10
 - Writing Group. *JAMA* 2003;289:2083-95
 - Knowler WC et al. *N Engl J Med*. 2002;346:393-403
 - Wing RR, Hill JO. *Annu Rev Nutr*. 2001

Not to mention an abundance of other science...

- Hu FB, Willert WC. Optimal diets for the prevention of coronary heart disease. *JAMA*. 2002;288:2569-78
- Grundy SM et al. Diet composition and the metabolic syndrome: what is the optimal fat intake? *Am J Med*. 2002;113:285-296
- Katz DL. Dietary Recommendations for Health Promotion and Disease Prevention. In: Katz DL. *Nutrition in Clinical Practice*. Lippincott Williams & Wilkins. 2000
- Walker KA, O'Dea K. *Annu Rev Nutr*. 2001;11:244-8
- Broun JE et al. *Int J Obes Relat Metab Disord*. 2001;25:45-53
- Gibsey MJ. Optimal macronutrient balance. *Proc Nutr Soc*. 1999;58:421-5
- McKeown NM. *Am J Clin Nutr*. 2002;76:390-8
- Riccioni G, Rivellese AA. *Br J Nutr*. 2000;83:1413-8

So perhaps it's time to stop parsing...

- and pass the parsley!
- Hit me in the head if you don't agree we should:
 - Reduce trans fat
 - Reduce saturated fat
 - Reduce sodium
 - Increase fruits and vegetables
 - Increase whole grains
 - Reduce refined starches and simple sugars
 - Replace "bad" fats with "good"
 - Increase fiber
 - Increase micronutrients
 - Control portion size and total calories
 - Increase physical activity

TIME Magazine / ABC News Summit on Obesity: 6/04

What food could do...

- 80% reduction in heart disease
- 90% reduction in diabetes
- 60% reduction in cancer
- and so on...

Empowering people means teaching them...
things they never knew they never knew-



Sodium content per 100 kcal?



Sodium
73 mg

Sodium
100 mg

Sodium
233 mg

Sodium
131 mg

Added sugar per 100 kcal?



Sugar
12 G



Sugar
11 G

Reinventing the food label...

- For dummies.

▪ Katz DL. Op-Ed, the Hartford Courant, 10/03

What? ... FDA or IOM would have done:

- July, 2003
 - Katz DL. A food supply for dummies. Op-Ed; Hartford Courant; NY Newsday; etc. 10/03
- Feb, 2006: If you want something done...
 - *and the rest is history...*

ONQI Scientific Expert/Development Panel

- Chair: Dr. David Katz, Yale University School of Medicine
 - Dr. Keith Ayoob, Albert Einstein College of Medicine
 - Dr. Leonard Epstein, University of Buffalo; inventor, Traffic Light Diet
 - Dr. David Jenkins, University of Toronto; inventor, Glycemic Index
 - Dr. Francine Kaufman, USC; Past President, American Diabetes Association
 - Dr. Robert Kushner, Northwestern University
 - Dr. Ronald Prior, Arkansas Children's Nutrition Center, USDA HNRC
 - Dr. Rebecca Reeves, Past President, American Dietetic Association
 - Dr. Barbara Rolls, Pennsylvania State University
 - Dr. Sachiko St. Jeor, University of Nevada
 - Dr. John Seffrin, President & CEO, American Cancer Society
 - Dr. Walter Willett, Harvard University
- 16 invitations extended; 14 acceptances
 - Project Coordinators: Debbie Kennedy, PhD; Zubaida Faridi, MD, MPH; PRC
 - Statistician/Data Analyst: Valentine Njike, MD, MPH; PRC
 - Dietitians: Judy Treu, MS, RD; Lauren Rhee, MS, RD; PRC
 - Others consulted

The ONQI Algorithm-

Numerator	Denominator	
Fiber	Saturated fat	<ul style="list-style-type: none"> •Universal Adjustors <ul style="list-style-type: none"> Fat quality Protein quality Glycemic load Energy density •Trajectory Scores •Weighting Coefficients
Folate	Trans fat	
Vitamin A	Sodium	
Vitamin C	Sugar	
Vitamin D	Cholesterol	
Vitamin E		
Vitamin B12		
Vitamin B6		
Potassium		
Calcium		
Zinc		
Omega-3 fatty acids		
Total bioflavonoids		
Total carotenoids		
Magnesium		
Iron		

ONQI formula

Something like:

$$(1+(UA1) \times (1+(UA2) \times (1+ WP1 \times WS1 \times WR1 \times (\text{adjusted TS1})))) \dots + WP16 \times WS16 \times WR16 \times (\text{adjusted TS16})$$

$$GL \times ED \times (1+ WP1 \times WS1 \times WR1 \times (\text{adjusted TS1})) \dots + WP5 \times WS5 \times WR5 \times (\text{adjusted TS5})$$

- Variables in Formula
 - TS = trajectory score
 - Wp = weighting coefficient, prevalence
 - Ws = weighting coefficient, severity
 - Wr = weighting coefficient, relative impact
 - UA1 = adjuster for biological quality of fat
 - UA2 = adjuster for biological quality of protein
 - ED = energy density adjuster
 - GL = glycemic load adjuster
 - Adjusted = pertinent mathematical transformations

And in all its (gore or) glory: 12 pages of mind-numbing computer programming

Sample Scores

PROTEIN	score	CEREAL	score
Atlantic salmon	87	Organic Healthy Fiber	
Sirloin steak	44	Multigrain Flakes	82
Ground beef, 70% lean	24	Kashi GoLEAN	43
		Quaker, Cap'n Crunch	3
PRODUCE	score	SALTY SNACKS	score
Oranges	100	Weight Watchers Smart Snackers	
Grapes	91	Microwave Popcorn	69
Iceberg lettuce	82	Pringles Fat Free Potato Crisps -	
		Sour Cream 'N Onion	29
		Crunchy Cheetos	3
DAIRY	score		
Skim Milk	91		
Whole Milk	52		
Whole Chocolate Milk	33		

When science means business...
perhaps it needs to *do* business



One number.
One decision.
One food at a time.

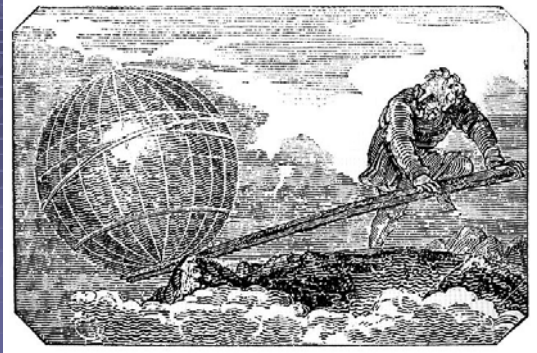
Expert nutritional knowledge
in a single score - allowing
people to make well-informed
choices, one food at a time.



NuVal *con tempo*



- Initial launch in supermarkets & on web: October, 2008
 - Lead market launch: Price Chopper; HyVee
 - www.nuval.com
- Ramp up: 2009
 - Up to 15 committed retailers, representing ~\$,000 stores
 - Finalizing contract with one of top 5 US retailers
 - Talks on-going with dozens of other retailers in US and Canada, representing thousands of additional stores
- Book series planned; Hachette Publishing
- Adaptations for total dietary scoring
 - Condition-specific ONQI variants for diabetes, hypertension, heart disease, weight management, etc.
 - ONQI variants tailored to particular dietary needs and preferences, e.g., vegetarian, gluten-free, nut-free, etc.
- Validation research: On-going; Harvard School of Public Health
- Initial scientific manuscript: *Am J Health Promotion*, under review
- Other Applications in the works: schools, federal programs
- Engagement of food manufacturers: on-going



If health is not its own incentive-

- then incentivize health:
 - <http://www.incentahealth.com/>

Let's eat out! *Virtually good dining...*

- www.healthydiningfinder.com

Avoiding (gastric) Bypass- *by Resolving an Impasse.*

- **O-W-C-H; this won't hurt a bit...**
- *On-line Weight Counseling instruction for Healthcare Providers*; National Obesity Action Forum, Washington, DC; 6/06
 - Katz DL, Behavior Modification in Primary Care: the Pressure System Model. *Prev Med.* 2001;32:66-72

www.owch.us

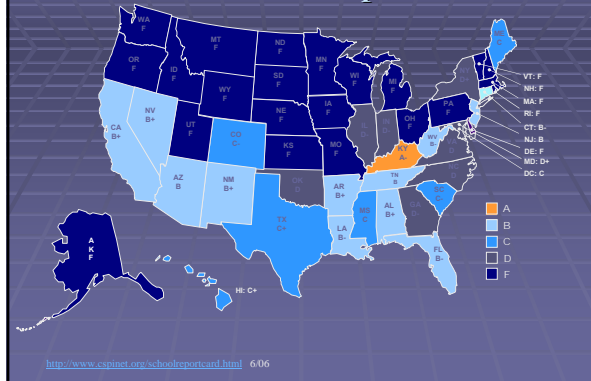
The Vision-

- On-line training
- CME credits
- Quality control indicators embedded
- Controlled access at first
- Cost-utility analysis
- Trust, verify, disseminate

Be sure that Schools lead, follow, or...

- are ashamed!
- National School Lunch Program Policies:
 - http://www.fns.usda.gov/cnd/Lunch/CompetitiveFoods/state_policies_2002.htm

School Foods Report Card



Of Will, & Ways-

- The WAY Program: <http://www.wayplanet.com>
- Planet Health
- CATCH
 - <http://www.sph.uth.tmc.edu/catch/>
- WE CAN
 - <http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/live-it/cool-slow-whoa.htm>
- Here's to You, Mr. Robinson-
 - <http://noty.stanford.edu/>
- PE4Life
- Take 10!
 - <http://www.take10.net/>

Meanwhile, *back at the ranch-*
common sense, from the bird's eye view:

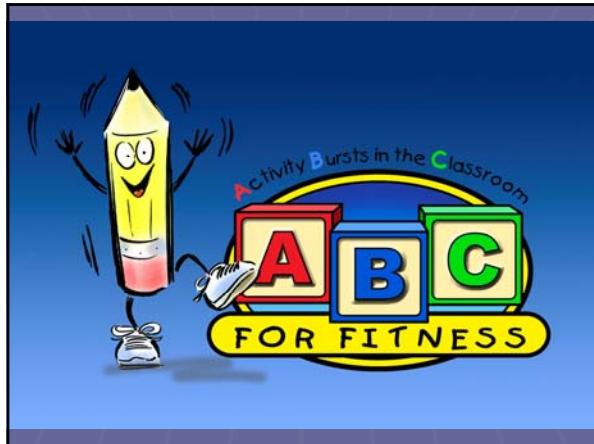
Katz DL. *School-Based Interventions for Health Promotion and Weight Control: Not Just Waiting on the World to Change.* *Annu Rev Public Health.* 2009 Jan 15. [Epub ahead of print]

Katz DL, O'Connell M, Njike VY, Yeh MC, Nawaz H. *Strategies for the prevention and control of obesity in the school setting: systematic review and meta-analysis.* *Int J Obes (Lond).* 2008 Dec;32(12):1780-9

No Child Left (on their) Behind-
Square Peg, Round Hole?

- As easy as "ABC" for Fitness-

Activity **B**ursts in the **C**lassroom



What is this **fruit juice** made of?

?

=

A Katz & Katz Production, 2008, Yale-Griffin Prevention Research Center

Do the ingredients match what you expect to be in this juice?

Yes

=

INGREDIENTS: 100% FRUIT JUICE (FILTERED WATER SUFFICIENT TO RECONSTITUTE APPLE, RED GRAPE AND PASSIONFRUIT JUICE CONCENTRATES), NATURAL FLAVORS, ASCORBIC ACID (VITAMIN C).

A Katz & Katz Production, 2008, Yale-Griffin Prevention Research Center

How about this one?

FRUIT PUNCH

A Katz & Katz Production, 2008, Yale-Griffin Prevention Research Center

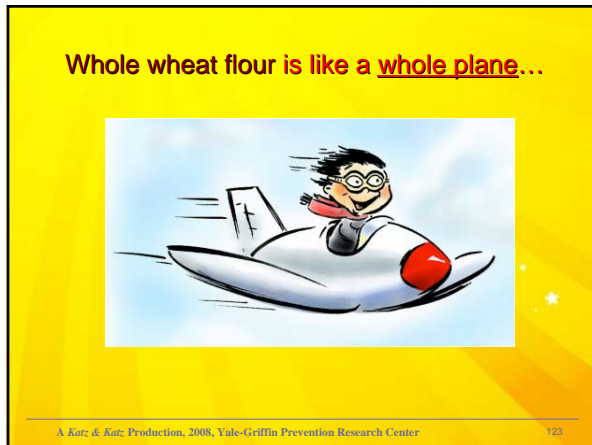
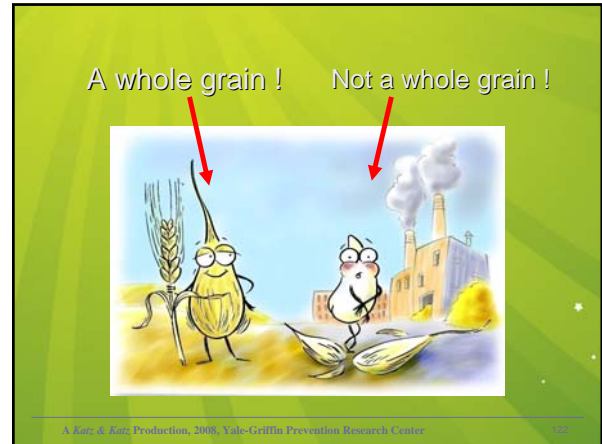
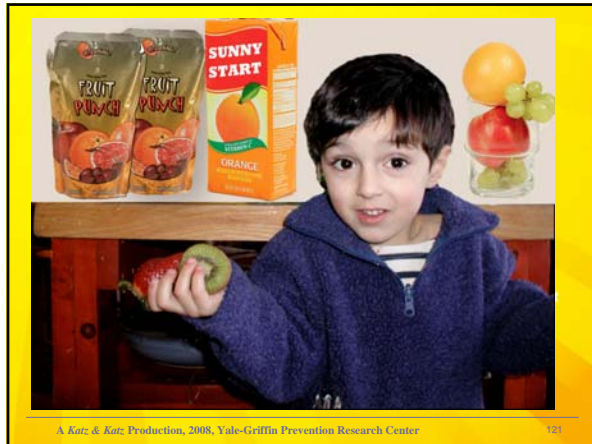
Do the ingredients match what you expect to be in this drink?

No

=

CONTAINS PURE FILTERED WATER, SWEETENERS (HIGH FRUCTOSE CORN SYRUP, SUGAR), LESS THAN 2% OF: CITRIC ACID (PROVIDES TARTNESS), POTASSIUM CITRATE (REGULATES TARTNESS), MODIFIED CORNSTARCH, PARTIALLY HYDROGENATED SOYBEAN OIL, VITAMIN C (ASCORBIC ACID), NATURAL AND ARTIFICIAL FLAVORS, YELLOW #6, YELLOW #5.

A Katz & Katz Production, 2008, Yale-Griffin Prevention Research Center



Remember the 5 Clues!

- #1 - Don't be fooled by **THE BIG LETTERS** on the front of the package. Look for the label on the back instead!
- #2 - The **FIRST** ingredient is always the biggest!
- #3 - Avoid partially hydrogenated oil & high fructose corn syrup. It's like finding a suspicious character in a crowd!
- #4 - Avoid foods with a **LONG** ingredient list!
- #5 - **FIBER** is your friend, so look out for whole grain imposters!

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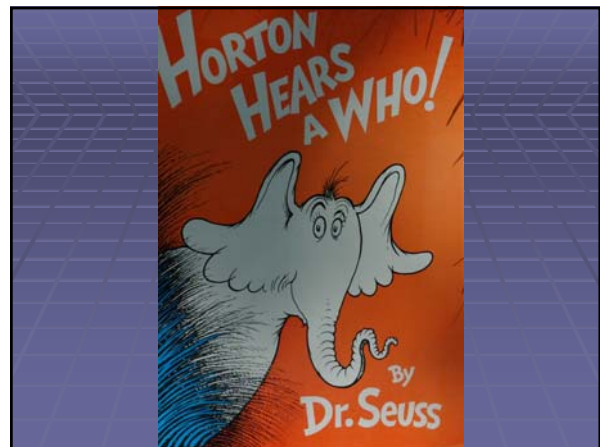
The measure of success...
 one sandbag at a time:

Are we dry yet?



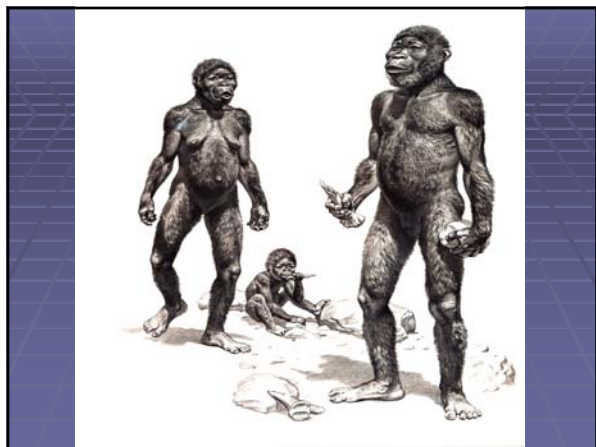
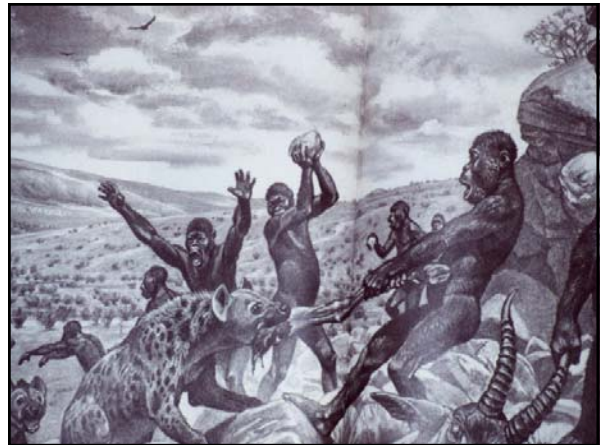
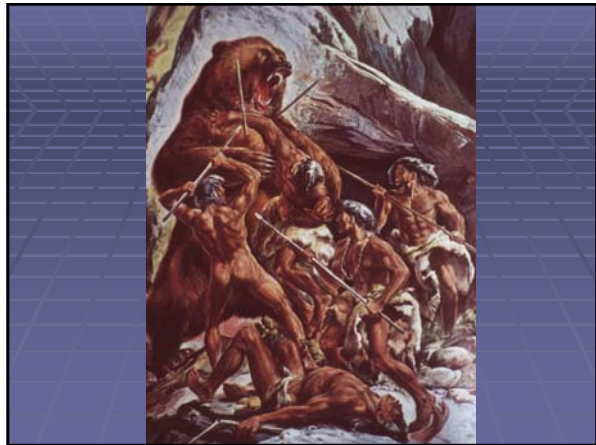
Who should lend a hand-

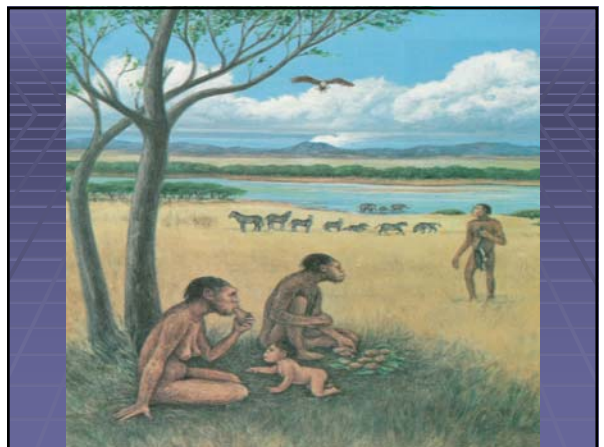
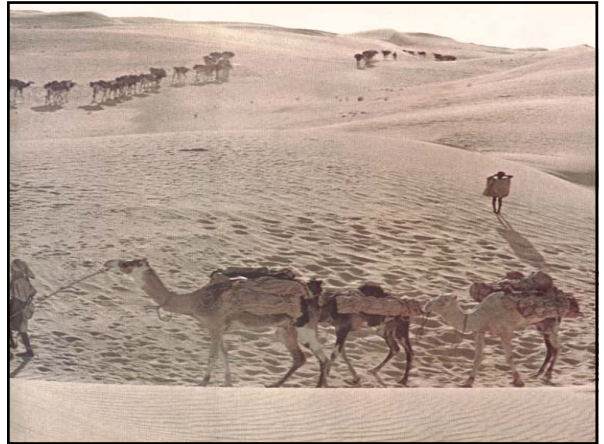
- and stack a bag of sand?

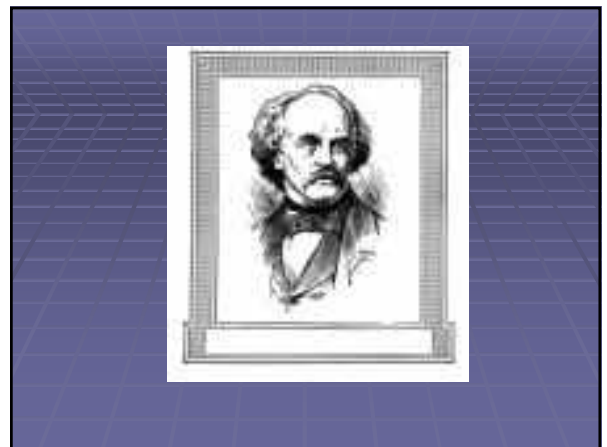
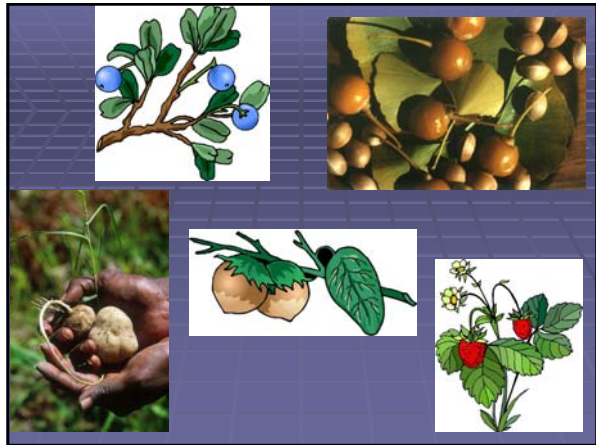
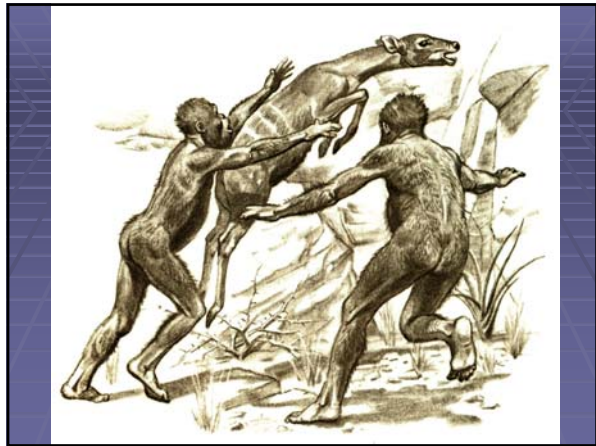


To turn the tide...

- It will take the whole Village
 - There is heavy lifting to be done- but in unity, there is strength!
- We have to do what is necessary
- We have to do what is right
- Everyone has to be part of the solution... or be part of the problem
- We have to understand the problem, and for that we need to understand ourselves... *in native context*









Eat food...

“... not too much, **mostly plants.**”

■ Michael Pollan





Thank you,

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