

BI 199 APWT Discussion 10

Heck Yeah! Fun again!



I. Announcements Presentation Schedule.

Next session 1st Group Quiz Bowl! Q?

II. Nutrition for Life Open discussion.

A. What is nutrition?

B. What nutrients are essential?

C. How much water do we need?

D. Energy nutrient? Energy from pill?

E. Drinking excess calories?

F. Why a plant-based diet?

G. Nutrition guidelines: US, AICR, ... 

H. Identifying a nutrition quack! Resources?

I. Fasting, Dieting, Exercise?

III. Getting to Know You! Q. from Pat

What the heck is nutrition?

L. *nutritio* - the study or science of...to nourish!



Macronutrients & Micronutrients Essential for Life

Macronutrients

H₂O/Water

✓ 1^o Carbohydrates

✓ 2^o Fats/Triglycerides/Lipids

✓ 3^o Proteins

Sample Food Sources

Water, other drinks, fruits
& vegetables

Grains, vegetables, fruits,
dairy products

Meats, full-fat dairy
products, oils

Meats, vegetables,
legumes

Micronutrients

NB: Need only minute quantities!

Vitamins (A, D, E, K; C + B)

Vegetables, vegetable oils,
fruits, dairy, citrus, grains

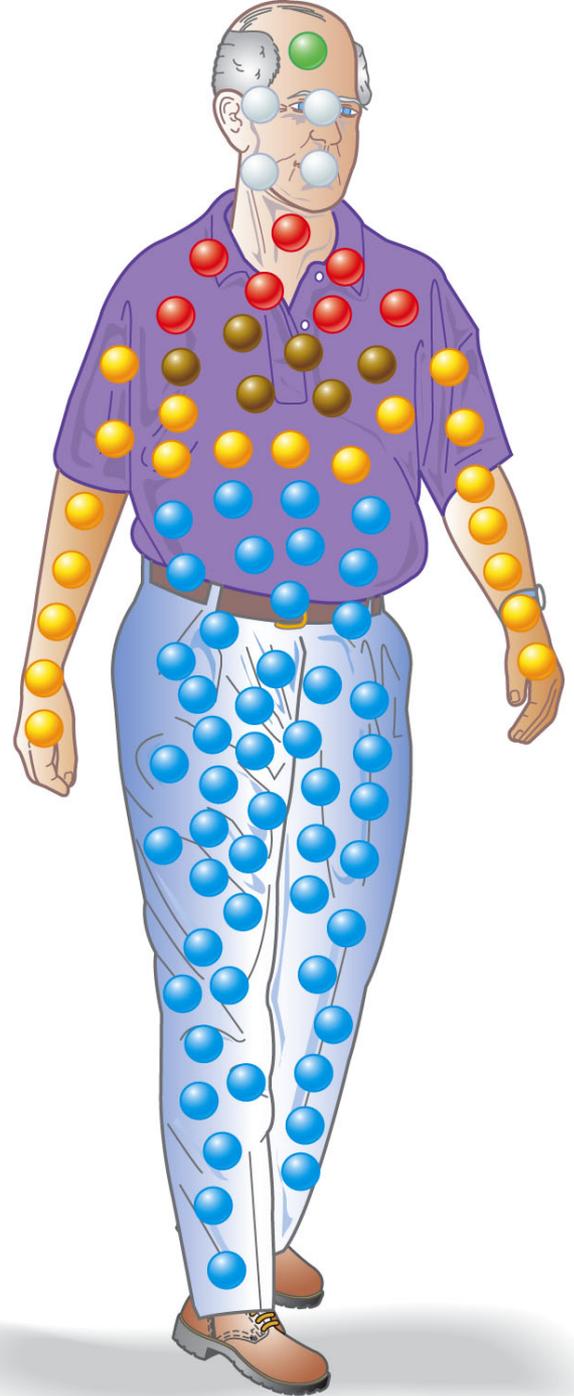
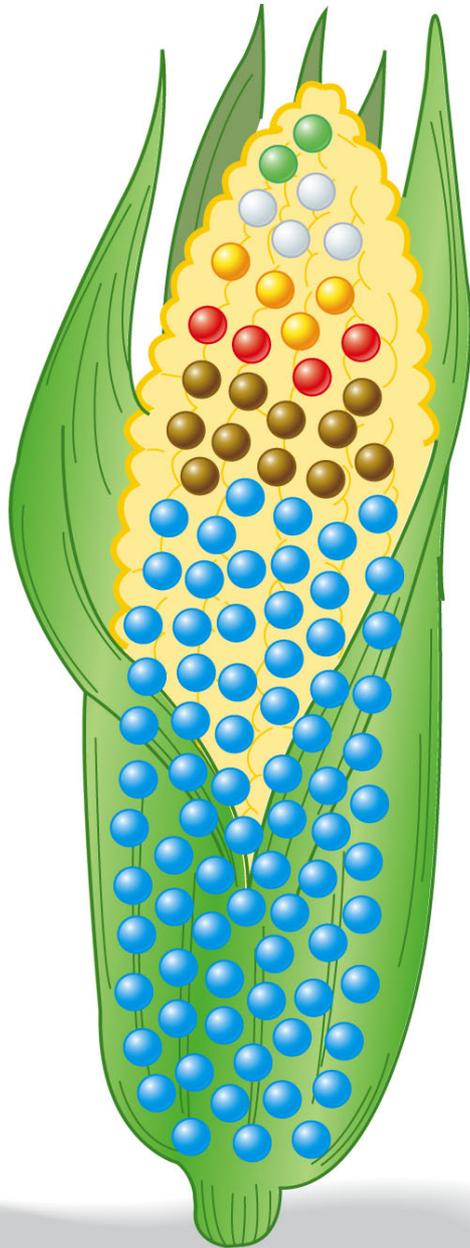
Minerals (K⁺, Na⁺, Ca²⁺, Mg²⁺
Fe²⁺, Zn²⁺, ...)

Fruits, processed foods,
dairy, nuts, vegetables,
grains, meats

✓ ***Energy nutrients = yield ATP***

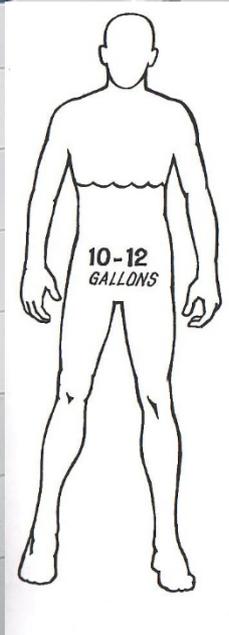


- Vitamins
- Minerals
- Fat
- Protein
- Carbohydrate
- Water



No, we're not watermelons,
but H₂O is definitely critical!!

because
you're **98%**
water.

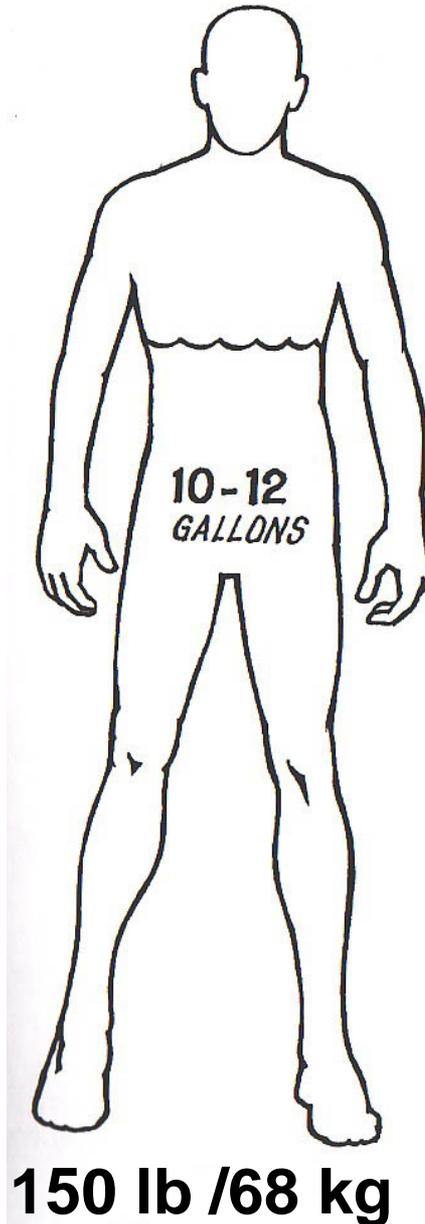


≠



Drink about 1 L per 1000 calories energy expenditure!!

Human ~ 2/3 H₂O
~ 60 – 70 %



NB: So 2000 kcal →
drink 2000 mL
≡ 67.63 fl oz
≡ ~ 8 cups!

= ~40 – 48 kg H₂O

Table 1-4

Calorie Values of Energy Nutrients

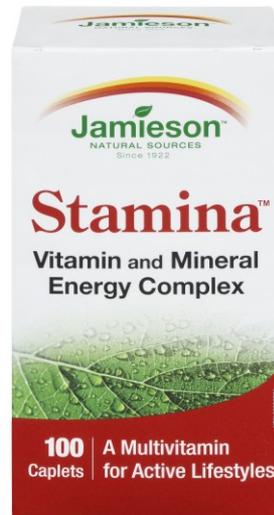
The energy a person consumes in a day's meals comes from these three energy-yielding nutrients; alcohol, if consumed, also contributes energy.

Energy Nutrient	Energy
Carbohydrate	4 cal/g
Fat (lipid)	9 cal/g
Protein	4 cal/g

© Cengage Learning

Note: Alcohol contributes 7 cal/g that the human body can use for energy. Alcohol is not classed as a nutrient, however, because it interferes with growth, maintenance, and repair of body tissues.

You Can't Get Energy from a Vitamin-Mineral Pill or Potion! Unless It Contains Energy Nutrients!



5 times per wk? \equiv 106,600 calories/yr \equiv \pm 30.5 lb fat/yr



Starbucks
Cinnamon
Dolce Latte,
whipped cream
Venti (20 oz.)

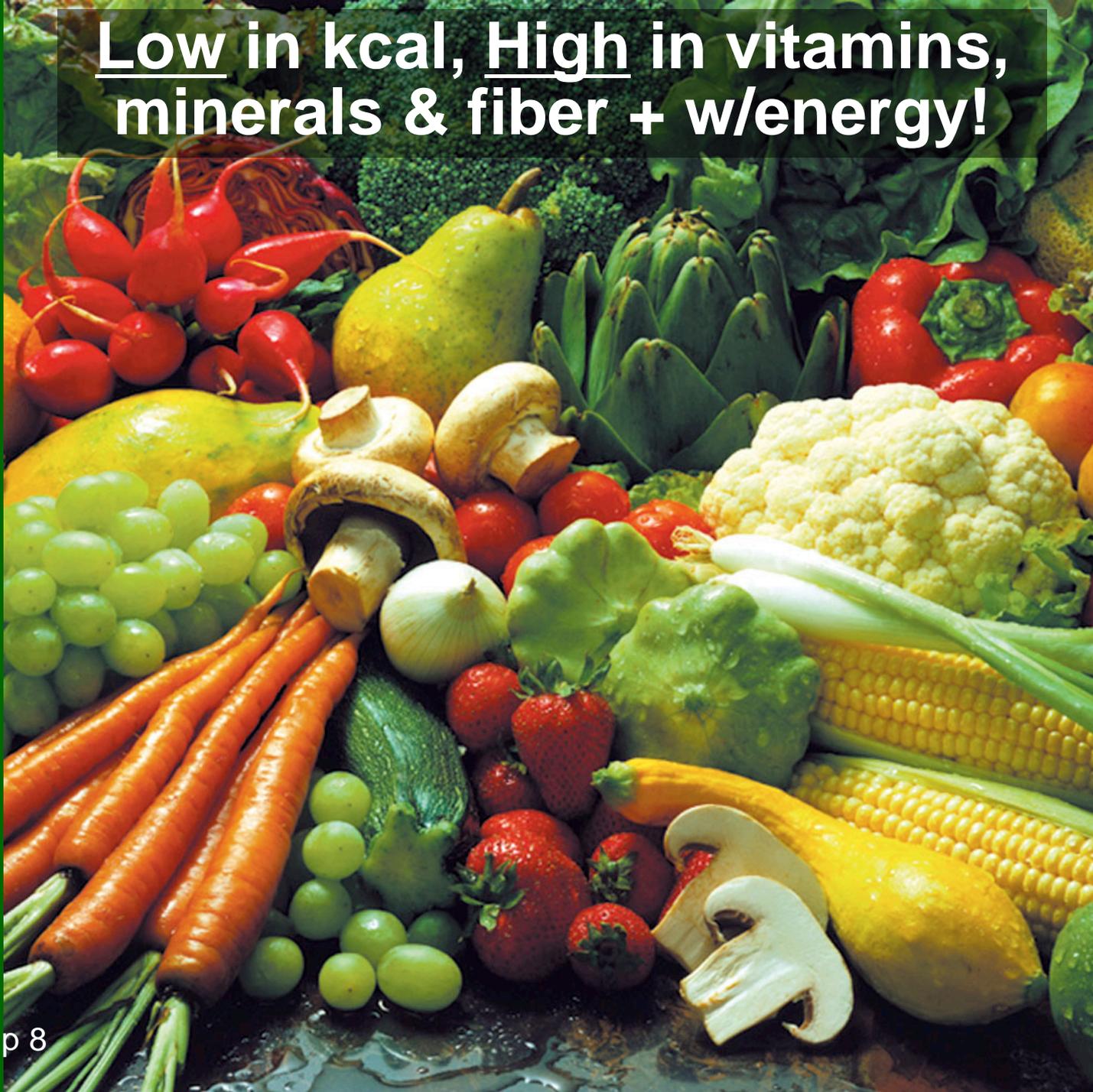
410 calories

Jogging | **50 min.**



**Better
choices!**

Low in kcal, High in vitamins,
minerals & fiber + w/energy!





Low in price (relatively)!

High in kcal (energy!), low in vitamins, minerals & fiber!



Potential regulators
of health!

10s of thousands!

① Anti-oxidants
protect DNA from
oxidative damage

② Protein synthesis
regulation/control

③ Hormone-like
action
endocrine mimicry

④ Blood effects
modify blood chemistry

Phytochemicals ≡ Plant chemicals

aroma, color, taste



*Broccoli sprouts may contain
~ 10,000 unique phytochemicals!*





A Wealth of Phytochemicals

All cruciferous vegetables contain powerful cancer-fighting phytochemicals, including:

diindolylmethane (DIM), one of many *indoles* found in these vegetables, has been shown to inhibit proteins associated with breast and ovarian cancers.

crambene, plentiful in Brussels sprouts, may offer the most preventive benefits when combined with *indole-3-carbinol* (I3C).

glucosinolates, which turn into powerful protective agents called *isothiocyanates* when a cruciferous vegetable is chewed or chopped. May reduce inflammation, a factor in cancer development.



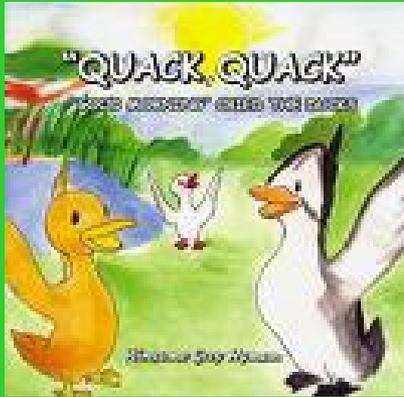
American Institute for Cancer Research

TABLE
C2-3

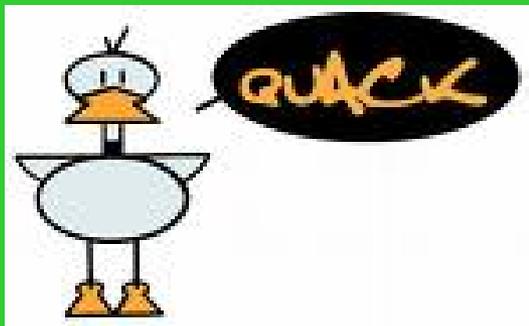
Common Foods Ranked by Antioxidant Content

1. Blackberries
2. Walnuts
3. Strawberries
4. Spinach
5. Artichokes, prepared
6. Cranberries
7. Coffee
8. Raspberries
9. Pecans
10. Blueberries
11. Cloves, ground
12. Grape juice, cranberry juice,
pomegranate juice
13. Chocolate, dark, unsweetened
14. Cherries, sour
15. Wine, red





Nutrition Quackery?



\$\$\$



Kleiner's & Monaco's Top 10 Hit List for Nutrition Quackery

- 1. Treatment based on unproven theory calling for non-toxic, painless therapy.**
- 2. Author's/purveyor's credentials aren't recognized in scientific community.**
- 3. No reports in scientific, peer-reviewed literature but rather mass media used for marketing.**
- 4. Purveyors claim medical establishment is against them & play on public's paranoia about phantom greed of medical establishment.**
- 5. Treatments, potions, drugs manufactured according to secret formula.**
- 6. Excessive claims promising miraculous cures, disease prevention or life extension.**
- 7. Emotional images rather than facts used to support claims.**
- 8. Treatments require special nutritional support including health food products, vitamins and/or minerals.**
- 9. Clients are cautioned about discussing program to avoid negative.**
- 10. Programs based on drugs or treatments not labelled for such use.**

Keys to Accurate & Reliable Internet Resources

1. Peer-reviewed by expert scientists in area?

Scientific: PubMed/Index Medicus

<http://www.ncbi.nlm.nih.gov/pubmed/>

Lay: Other US Gov Websites *.gov*

<http://www.nutrition.gov/>

National Organization websites *.org*

[American Heart Association.org](http://www.AmericanHeartAssociation.org) *Getting Healthy*

Nutrition Action Health Letter *.org*

<http://www.cspinet.org/nah/index.htm>

UC Berkeley Wellness Letter *.com?*

<http://www.wellnessletter.com/ucberkeley/>

2. .edu, .org, .gov rather than *.com* (in most cases)

3. Check About Us! That is, investigate web origin!

SCIENTIFIC AMERICAN



It started as fuel, became a passion, ignited a global crisis—and made us human

food

You Don't Know CALORIES

The Truth About GMOs

Why We Needled

BerkeleyWellness.com

University of California, Berkeley

Wellness Letter

News and expert advice from the School of Public Health

55.00 • Volume 29 • Issue 1 • September 2013

WellnessFacts

Daily sunscreen use slows skin aging, even in middle-aged people. According to a well-designed Australian study in the *Annals of Internal Medicine*, it's clear that consistent sunscreen use reduces the risk of skin cancer, but this is the first proof to humans that it also protects against photoaging—the wrinkling, dark spots, and sagging skin caused by the sun's ultraviolet rays. More than 900 white people ages 25 to 55 were either instructed to use broad-spectrum sunscreen (SPF 15) diligently every day or simply told to use sunscreen at their discretion. It would have been unethical to tell them not to use sunscreen at all. After four years, the daily sunscreen group had 24 percent less skin aging, on average, than the other group.

Two-thirds of customers at fast-food restaurants underestimate their calorie intake, often by hundreds of calories. A recent study in the *Journal ofAMA* has found. Adults consumed 836 calories per meal and underestimated by 173 calories, on average. Teenagers ate 750 calories, but misjudged by 259 calories. About one in four people underestimated by more than 500 calories. Underestimation was greatest among Subway diners, partly because of the chain's "eat it up" ad effect: the researchers suggested the Affordable Care Act will require calorie labeling at fast-food restaurants, though research on the effect of calorie displays has been mixed. Young and middle-aged Americans get 10 to 15 percent of their calories from fast food, according to CDC data.

Men with prostate cancer who take statin drugs to lower their cholesterol have a reduced risk of dying from the disease. A recent study in *The Prostate*, the researchers tracked 1,000 Seattle-area men diagnosed with prostate cancer over a 10-year period and found that statin users were 80 percent less likely to die from the cancer than non-users, they concluded for use, weight, severity

Salt: Is lower not better after all?

An important new report shakes up some assumptions about sodium

Don't worry about sodium... . Cut back on sodium... . Consume a lot less sodium... . Don't go too low in sodium. Over the past few decades, Americans have been subjected to shifting messages about sodium: a main component of salt and once undervalued, it's been over more by a recent report from the Institute of Medicine (IOM), which suggests that a very low sodium intake could be bad for some people. Confused? We don't blame you.



A salty tale
For years health and nutrition experts emphasized reducing dietary fat and cholesterol and seemed to be less concerned about sodium. But as evidence mounted that excess sodium increased the risk of high blood pressure—a leading cause of heart attacks, strokes, and kidney failure—sodium took a more central place in dietary advice, and health officials began advising lower limits for more people.

In 2005 the government's Dietary Guidelines recommended a maximum of 2,300 milligrams of sodium a day (the amount in about a teaspoon of salt) and 1,500 milligrams for people at higher cardiovascular risk—everyone over 50, all African Americans, and anyone with hypertension, diabetes, or chronic kidney disease. (Protein-rich fish had long said to choose and prepare foods with less salt and, before that, to keep sodium intake "moderate.") Because 70 percent of U.S. adults fall

1,500-milligram daily limit for everyone, regardless of age and health status. Research has consistently shown that when people reduce sodium, blood pressure drops—especially in those who already have elevated blood pressure or are "salt sensitive" (that is, their blood pressure is more responsive to sodium intake). For example, studies on the DASH (Dietary Approaches to Stopping Hypertension) eating plan, which restricts sodium to either 2,300 or 1,500 milligrams a day, have found that the diet reduces blood pressure at both sodium levels, but more so at the lower limit. (Besides lowering sodium, DASH also emphasizes fruits and vegetables and low-fat and nonfat dairy foods, along with whole grains, fish, poultry, and nuts.)

According to the World Health Organization, hypertension is a leading factor in worldwide deaths and can be prevented by reducing salt intake and making other lifestyle changes.

Reigniting the debate
In May the IOM shook things up when it announced that despite current sodium recommendations, very low levels are not necessarily better and may even be harmful. The IOM is an independent nonprofit organization that convenes expert committees to examine health and disease trends, and the public at large health issues. The Salt Institute and other food industry groups welcomed the news, arguing that there should not be population-wide recommenda-

Nutrition Action HEALTH LETTER

Sugar Belly

How Much is Too Much Sugar?
BY BONNIE LIEBMAN

Wellness Letter

Is being overweight okay after all?

If being a study looking at whether body weight affects blood pressure. If you published it in a peer-reviewed journal, you'd have a hard time getting it out of the researchers' hands. So we're going to do it for you.

Where to draw the line
First of all, what's more important is to understand that obesity is a complex condition with many underlying causes. The BMI (Body Mass Index) is a simple measure of body weight relative to height, but it doesn't take into account muscle mass, bone density, or other factors. A BMI of 30 or higher is generally considered obese, but this doesn't necessarily mean you're unhealthy. Some people with a BMI of 30 or higher are very fit and have no health problems. On the other hand, some people with a BMI of 25 or higher are not fit and have health problems. So, while BMI is a useful tool, it's not the only one. We need more research to understand the relationship between body weight and health.

Wellness Letter

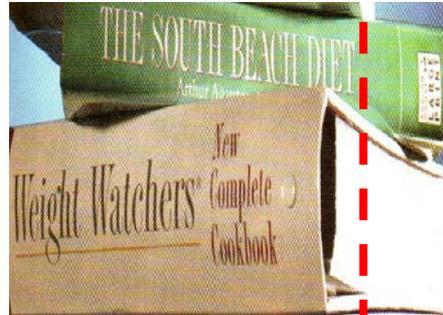
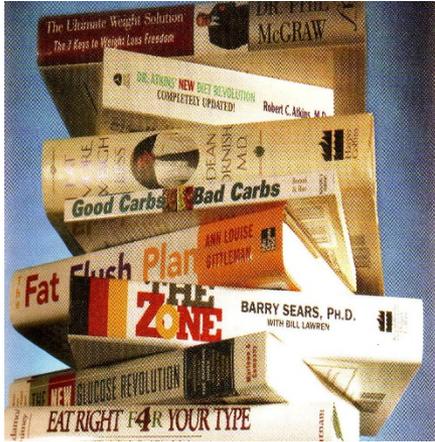
Wheatophobia

Nutrition Action HEALTH LETTER

SAVE OUR SEAFOOD

What's good for us and the oceans

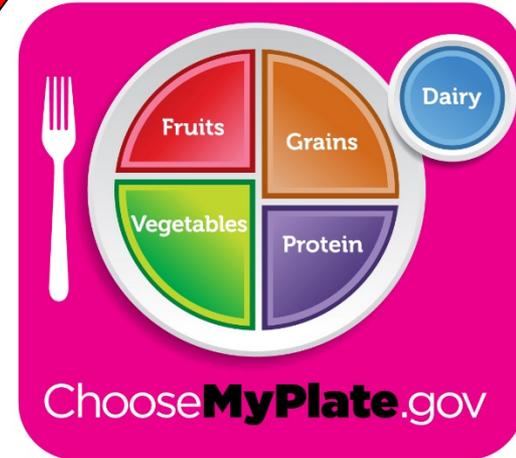
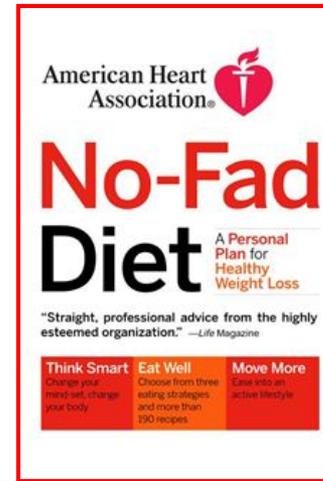
NOT PEER-REVIEWED = TRADE BOOKS



PEER-REVIEWED = TEXTS → RESEARCH



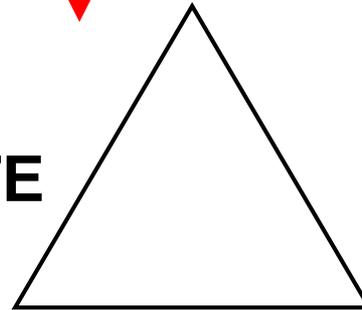
AHA + DASH + MAYO CLINIC



FAST LOW CARBOHYDRATE



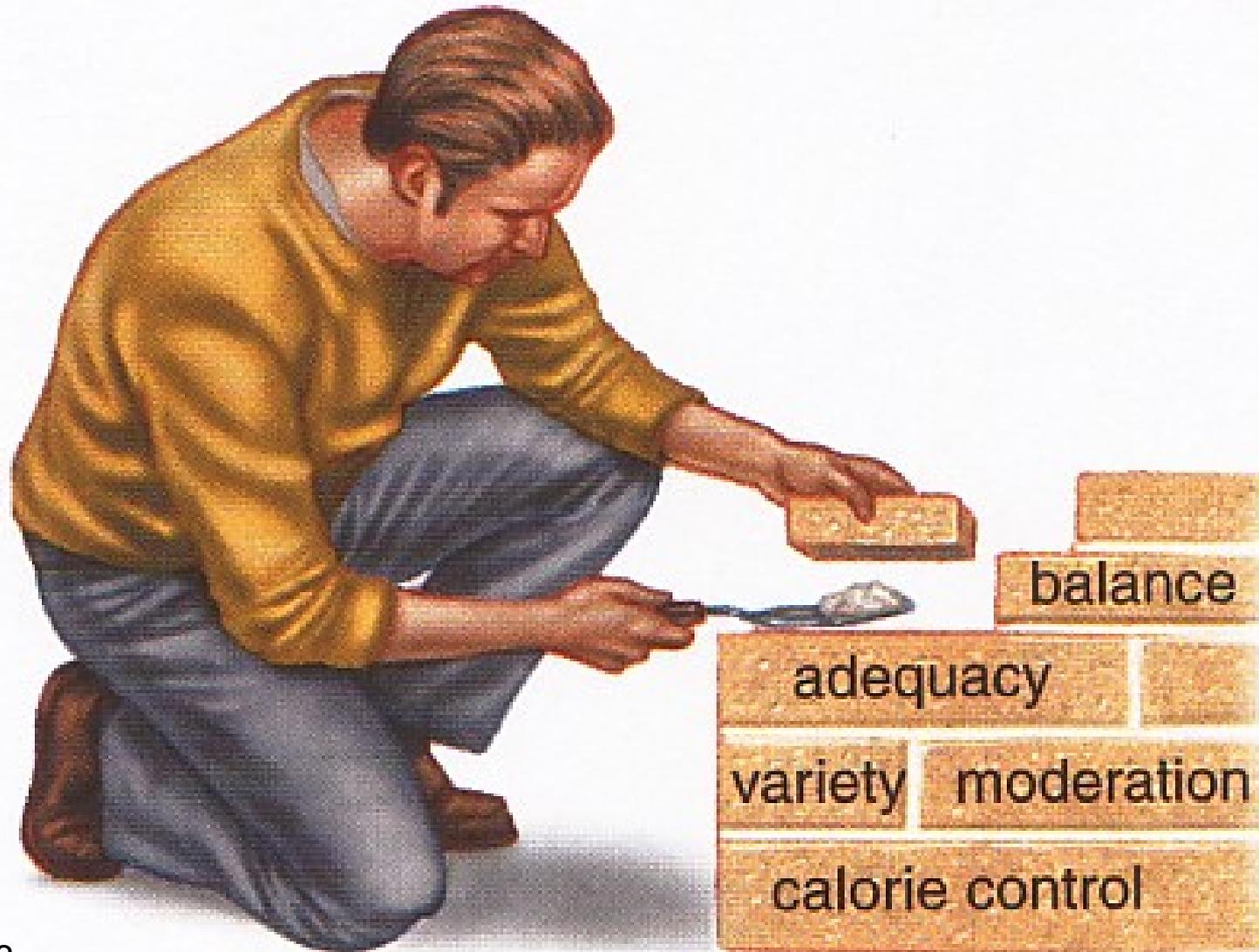
ELIMINATE CALORIES or FOOD GROUPS

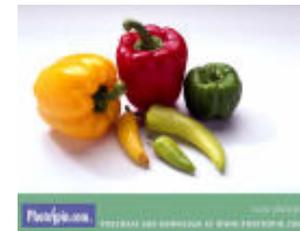


LOW FAT

ADEQUACY, BALANCE, CONSISTENCY & MODERATION

*All of these factors help to build
a nutritious diet.*





VARIETY IN THE DIET



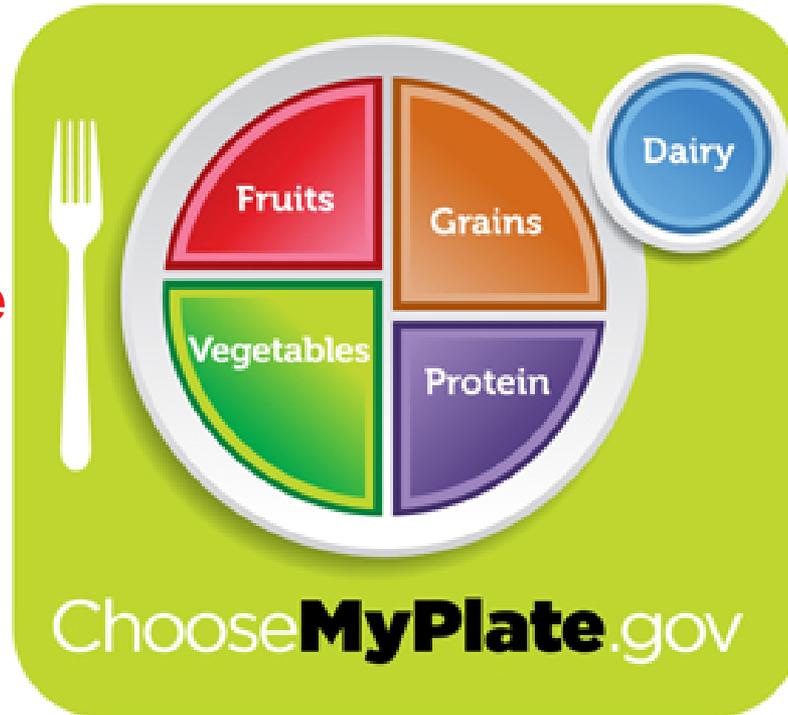
Most people naturally vary and balance their food choices. They enjoy a variety of foods and consume a variety of nutrients. With little effort, their daily food choices stack into a pyramid.

But some active people are eating a linear diet: bagels, bagels, bagels; apples, apples, apples. One of my clients ate spaghetti for breakfast, lunch, and dinner day after day and month after month. This repetitive eating kept life simple, minimized decisions, and simplified shopping. But it also resulted in an inadequate diet and chronic fatigue.



MyPlate launched June 2, 2011

2. Focus on fruits.
Whole fruit preferable to juice, but any fruit counts!
Fill $\frac{1}{2}$ your plate with fruits & vegetables!



3. Make at least $\frac{1}{2}$ of your grains whole grains!

5. Get your calcium-rich foods. Buy skim or 1% milk. Go easy on cheese!

1. Vary your veggies.
Fill $\frac{1}{2}$ your plate with fruits & vegetables!

4. Go lean with protein. Keep protein to $< \frac{1}{4}$ plate! Nuts, beans, peas, seeds, poultry, lean meat, seafood,...

Diet & Health Guidelines for Cancer Prevention

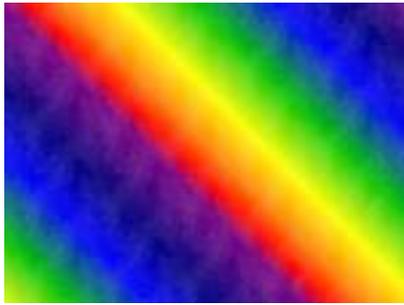
- 1. Choose a diet rich in variety of plant-based foods.**
- 2. Eat plenty of vegetables & fruits.**
- 3. Maintain a healthy weight & be physically active.**
- 4. Drink alcohol only in moderation, if at all.**
- 5. Select foods low in fat & salt.**
- 6. Prepare & store food safely.**

And always, remember...

Do not smoke or use tobacco in any form.



American Institute for Cancer Research (AICR)



Eating the Rainbow Hawaiian Style!!



Your plate should be the size of a Frisbee, not a manhole cover.

When it comes to colorful foods, Fruit Loops don't count.

A surprising number of people get 1/5 of their calories from sodas or other liquids.

If you look at the label & need a chemistry degree to read it, put the item back on the shelf!



SOURCE: P. Rath, *Honolulu Advertiser*, Sept 11, 2008 citing D. Chong & N. Kerr.



How much aerobic?

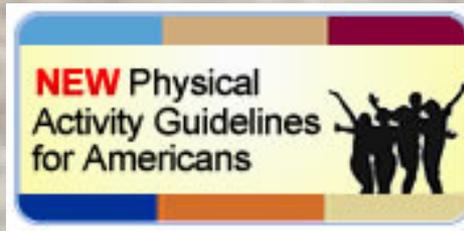


Continuous exercise
≥ 50% muscle mass
≥ Conversational pace
20-60 min/session
3-5 days/wk



<http://www.acsm.org/about-acsm/media-room/news-releases/2011/08/01/acsm-issues-new-recommendations-on-quantity-and-quality-of-exercise>

Federal exercise guidelines include strength training for all
<http://www.health.gov/paguidelines/guidelines/default.aspx>



Adults: Moderate to Vigorous Exercise \geq 30 min, 5 d/wk

Children: Moderate to Vigorous Exercise \geq 60 min, 5 d/wk

Diet vs.
Exercise?



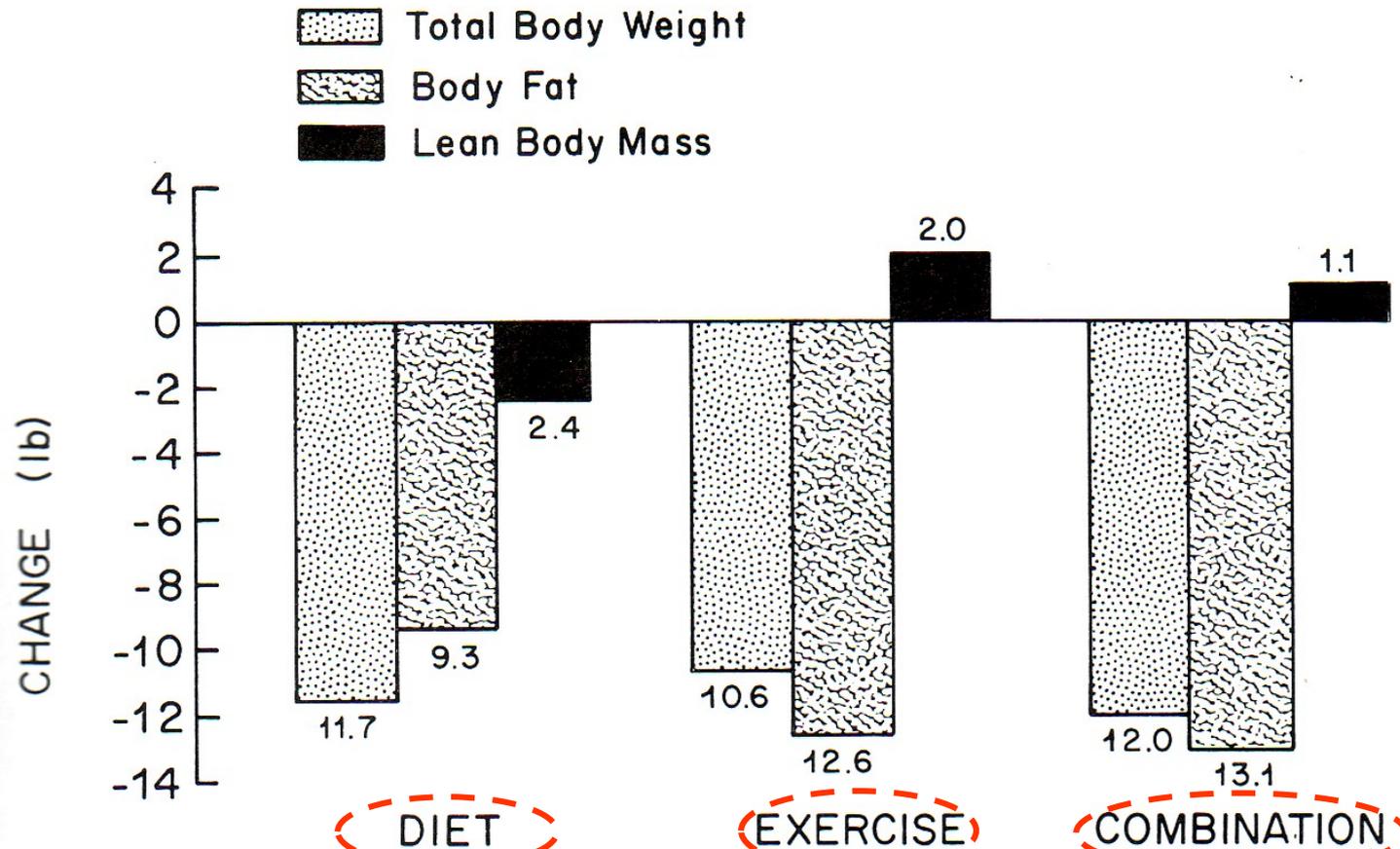


Figure 4-9. Changes in body weight, body fat, and lean body weight for diet, exercise, and combination groups. (From Zuti W. B., and Golding, L. A.: Comparing diet and exercise as weight reduction tools. *Phys. Sportsmed.* 4:49-53, 1976.)

NB: Each group 500 kcal deficit/day, 16 weeks



Exercise is better than dieting in lowering body fat & preserving muscles!



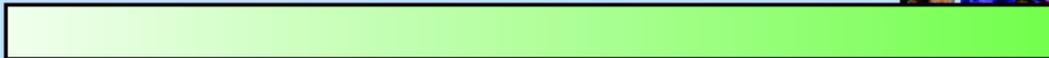
Dietary Composition & Physical Endurance

eg, Atkins!

High-fat diet



Normal mixed diet



High-carbohydrate diet



~ 1/3 endurance!

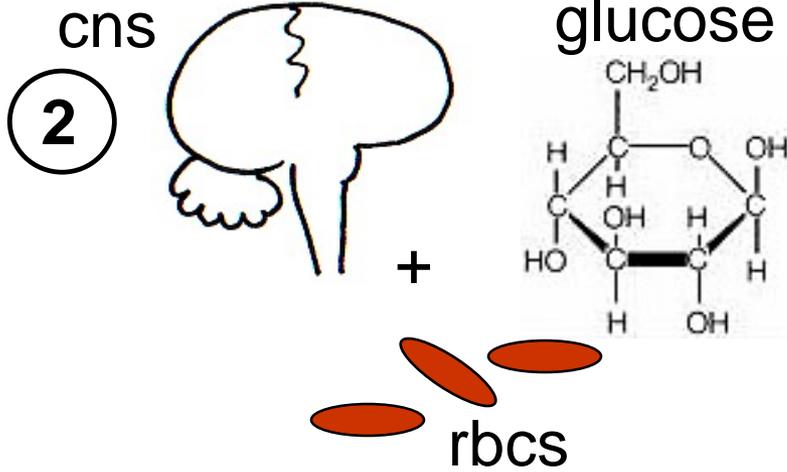
Maximum endurance time:

57 min

114 min

167 min





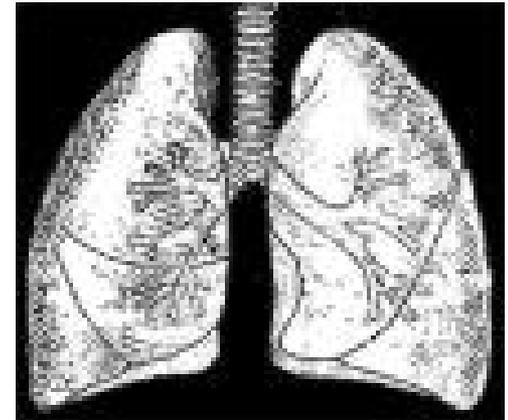
Negative Effects of Low Carbohydrate

1



- ① ↑ fatigue/exhaustion central & peripheral!
- ② ↓ glucose – brain+spinal cord, rbcs thrive upon.
- ③ ↓ variety which reduces intake of phytochemicals, vitamins, minerals & fiber.
- ④ ↑ risk of respiratory infections.

4



+ gall stones,
↓ thermoregulation...

We're better at storing fat vs carbohydrate!

Dietary Fat



3 % Kcal

Body Fat



23 % Kcal

**Dietary
Carbohydrate**



To Help Lower Body Wt & %Fat
EXERCISE!! +*Minimize* These!!



FAT 9 Kcal/g

ETOH 7 Kcal/g

CARB 4 Kcal/g

PRO 4 Kcal/g

**NB: *Minimize* not *Eliminate!*
Moderation not *Abstinence!!***

***I'm not sure I believe you!
Why can't I just starve to
lose weight?***



**TOTAL FAST =
No Energy Nutrients
(No Carbohydrates, Fats
or Proteins)**

ONLY

- 1. Water**
- 2. Vitamins**
- 3. Minerals**

60-day Fast???

Lost 60 lb!! Wow!!

Yet

>3/4 {
26 lb Water
20 lb Lean Body Mass
14 lb Fat

Fat < 1/4 total wt loss!

***You can lose weight by
starving – but it's mostly
water & muscle! Also, there
can be complications!***



Potential Complications of Total Fasting

**Nausea, diarrhea, persistent vomiting,
postural hypotension, nutritional
deficiencies, menstrual irregularities,
and...sudden death.**

Positive Aspect??

**General loss of appetite within
first 2 days, maintained
throughout fasting period.**

Introduction & Cards

Last Name, First Name, Nickname, Phone, e-mail

Major/Undeclared/Area of Interest

Academic Status: (Fr), So, Jr, Sr, PB, MS, PhD, CEP

Professional Objective: eg, RD, MD, PhD, DO/TBA?

Hometown, Birthplace

Prior related course work? eg, A&P, Hum Bio, Nutr

High School, Prior Community Colleges/Universities?

Family/Special Interests/Hobbies

Secret/Something unique about you?