I. **Announcements** Presentation Schedule. Next session 1\textsuperscript{st} 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° Carbohydrates**
- ✔️ **2° Fats/Triglycerides/Lipids**
- ✔️ **3° Proteins**

## Micronutrients
- NB: Need only minute quantities!
- **Vitamins (A, D, E, K; C + B)**
- **Minerals (K⁺, Na⁺, Ca²⁺, Mg²⁺, Fe²⁺, Zn²⁺,...)**

## Sample Food Sources
- **Water, other drinks, fruits & vegetables**
- **Grains, vegetables, fruits, dairy products**
- **Meats, full-fat dairy products, oils**
- **Meats, vegetables, legumes**
- **Vegetables, vegetable oils, fruits, dairy, citrus, grains**
- **Fruits, processed foods, dairy, nuts, vegetables, grains, meats**

✔️ **Energy nutrients = yield ATP**
No, we’re not watermelons, but H$_2$O is definitely critical!!

because you’re 98% water.
Drink about 1 L per 1000 calories energy expenditure!!

Human ~ 2/3 H₂O
~ 60 – 70 %

= ~40 – 48 kg H₂O

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

<table>
<thead>
<tr>
<th>Energy Nutrient</th>
<th>Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>4 cal/g</td>
</tr>
<tr>
<td>Fat (lipid)</td>
<td>9 cal/g</td>
</tr>
<tr>
<td>Protein</td>
<td>4 cal/g</td>
</tr>
</tbody>
</table>

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 \text{ calories/yr} \equiv \pm 30.5 \text{ lb fat/yr}

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!
Phytochemicals ≡ Plant chemicals

Potential regulators of health!

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

10s of thousands!

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.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Blackberries</td>
</tr>
<tr>
<td>2.</td>
<td>Walnuts</td>
</tr>
<tr>
<td>3.</td>
<td>Strawberries</td>
</tr>
<tr>
<td>4.</td>
<td>Spinach</td>
</tr>
<tr>
<td>5.</td>
<td>Artichokes, prepared</td>
</tr>
<tr>
<td>6.</td>
<td>Cranberries</td>
</tr>
<tr>
<td>7.</td>
<td>Coffee</td>
</tr>
<tr>
<td>8.</td>
<td>Raspberries</td>
</tr>
<tr>
<td>9.</td>
<td>Pecans</td>
</tr>
<tr>
<td>10.</td>
<td>Blueberries</td>
</tr>
<tr>
<td>11.</td>
<td>Cloves, ground</td>
</tr>
<tr>
<td>12.</td>
<td>Grape juice, cranberry juice, pomegranate juice</td>
</tr>
<tr>
<td>13.</td>
<td>Chocolate, dark, unsweetened</td>
</tr>
<tr>
<td>14.</td>
<td>Cherries, sour</td>
</tr>
<tr>
<td>15.</td>
<td>Wine, red</td>
</tr>
</tbody>
</table>
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

   **Lay:** Other US Gov Websites .gov

   National Organization websites .org
   [American Heart Association.org](http://www.americanheart.org)
   [Getting Healthy](http://www.americanheart.org)
   [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!
Outstanding Peer-Reviewed Lay Resources
NOT PEER-REVIEWED = TRADE BOOKS

FAST LOW CARBOHYDRATE
ELIMINATE CALORIES or FOOD GROUPS

PEER-REVIEWED = TEXTS → RESEARCH

AHA + DASH + MAYO CLINIC

LOW FAT

ADEQUACY, BALANCE, CONSISTENCY & MODERATION
All of these factors help to build a nutritious 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.
2. Focus on fruits. Whole fruit preferable to juice, but any fruit counts! Fill ½ your plate with fruits & vegetables!

3. Make at least ½ of your grains whole grains!

4. Go lean with protein. Keep protein to < ¼ plate! Nuts, beans, peas, seeds, poultry, lean meat, seafood,…

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

How much aerobic?

Continuous exercise

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

Federal exercise guidelines include strength training for all

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

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

Diet vs. Exercise?

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: ~ 1/3 endurance!

Normal mixed diet

High-carbohydrate diet

Maximum endurance time:
- 57 min
- 114 min
- 167 min
Negative Effects of Low Carbohydrate

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.

+ 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

ML Pollock & JH Wilmore 1990.
60-day Fast???

Lost 60 lb!! Wow!!

Yet

\[ \frac{3}{4} \]

\[ \begin{align*}
&26 \text{ lb Water} \\
&20 \text{ lb Lean Body Mass} \\
&14 \text{ lb Fat}
\end{align*} \]

Fat < \( \frac{1}{4} \) 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.

ML Pollock & JH Wilmore 1990.
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?