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NUTRITION ASSESSMENT

M1 - Endocrine/Reproduction Sequence

Virginia Uhley PhD, RD

Winter, 2009
Famous Quote

“If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health.”

Hippocrates c. 460-377 B.C.
Nutritional Assessment

- 5 components
  - A. Anthropometry
  - B. Biochemical
  - C. Clinical Examination
  - D. Dietary Evaluation
  - E. Energy Expenditure (Physical Activity)
Anthropometry

- Height
- Weight
- BMI
- Waist Circumference
- % Body Fat
**Body Mass Index (BMI)**

body weight kg/height m²

<table>
<thead>
<tr>
<th>Obesity Class</th>
<th>BMI (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5 - 24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 - 29.9</td>
</tr>
<tr>
<td>Obesity I</td>
<td>30.0 - 34.9</td>
</tr>
<tr>
<td>Obesity II</td>
<td>35.0 - 39.9</td>
</tr>
<tr>
<td>Extreme Obesity</td>
<td>≥40</td>
</tr>
</tbody>
</table>

Source Undetermined
Waist Circumference (cm)

Men > 102 cm (> 40 in)
Women > 88 cm (> 35 in)
Total Body Fat

- **Men:** ③ risk > 25% of total body weight
  - Healthy level 15%
- **Women:** ③ risk > 30–40% of body weight
  - Healthy level 25%
Diet History

- 24-hour recall
- Food Frequency
- Usual Intake
- Food Record
24-Hour Recall

- Documents a patient’s intake of all food and beverages during the previous 24-hour period.
- Many patients do not remember what they ate and can not accurately estimate quantities consumed.
- Ideal for patients with diabetes-ability to assess timing of meals, snacks, and insulin injections.
Usual Intake Method

- Documents a patient’s usual intake, including breakfast, lunch, dinner, and snacks.
- Many patients are not consistent with their eating habits and state that there is no usual pattern.
- Ideal for elderly patients in order to assess number of meals eaten (or skipped), and infants, children, and adolescents whose diets may not be as varied.
Food Frequency Method

- Estimate the frequency and quantity of foods eaten during a weekly or monthly period.
- Ideal method to estimate fat, sodium, sugar, dairy, fruit and/or vegetable intake.
- Ideal for patients with CVD, HTN, osteoporosis, those that question whether they should take a vitamin supplement, and elderly who avoid food groups.
Food Record Method

- Written record by the patient of everything they ate and drank over a 2 to 7 day period.
- Many patients are not motivated to write down everything. (although those who do, may lose weight.)
- Difficult for physicians to take the time to review and comment, especially if not trained.
- Ideal for patients who have difficulty losing weight, those who are eating out of control and gaining weight, brittle diabetics, emotional eaters.
Images of WAVE assessment form removed

Form can be accessed here: http://bms.brown.edu/nutrition/tools.htm

Four pages of Weight Activity Variety Excess (WAVE) assessment form developed by Brown University Institute for Community Health Promotion.

Access here: http://bms.brown.edu/nutrition/tools.htm
Assessing Nutrient Intake

- Assess energy requirements via Harris Benedict Equation.
- Compare current caloric intake with calculated requirements.
Estimation of Resting Energy Requirements (REE) for adults

- **Harris Benedict Equation**
  - derived from healthy adults
  - calculates resting energy expenditure
  - additional stress and activity factors added
  - REE for males: $66 + [13.7 \times \text{wt (kg)}] + [5.0 \times \text{ht (cm)}] - [6.8 \times \text{age}] = \text{kcal/day}$
  - REE for females: $655 + [9.7 \times \text{wt (kg)}] + [1.8 \times \text{ht (cm)}] - [4.7 \times \text{age}] = \text{kcal/day}$
Calculation to Estimate Caloric Needs to Maintain Body weight

- (Current Weight, in lbs) x (A) = Daily Caloric Needs.
  - A = activity level
    - Not very active    12
    - Moderately active 15
    - Very Active        20
    - Extremely Active   25
Calculation for Estimate of Basal Metabolic Rate

- Men = 1 x body weight (kg) x 24
- Women = .9 x body weight (kg) x 24

calculates basic expenditure of calories in a 24 hour period.
ESTIMATED ENERGY REQUIREMENTS

- BASED ON INSTITUTE OF MEDICINE DIETARY REFERENCE INTAKES, 2002
Estimated Energy Requirements (EER) for toddlers (ages 1-3)

- Kcal/day = (89 x weight (kg) - 100) + 20

  Institute of Medicine 2002
Children (ages 3-8)

- EER:
  - Male = 88.5 – (61.9*age)+PA*(26.7*weight [kg]+903*Height [m])+20
  - Female = 135.3 – (30.8*age) +PA*(10*weight [kg]+934*height[m])+20
## Physical Activity Coefficients (PA)

<table>
<thead>
<tr>
<th></th>
<th>Sedentary</th>
<th>Low Active</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-18 yrs</td>
<td>1.00</td>
<td>1.13</td>
<td>1.26</td>
</tr>
<tr>
<td>Adults</td>
<td>1.00</td>
<td>1.11</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-18 yrs</td>
<td>1.00</td>
<td>1.16</td>
<td>1.31</td>
</tr>
<tr>
<td>Adults</td>
<td>1.00</td>
<td>1.12</td>
<td>1.27</td>
</tr>
</tbody>
</table>
EER CALCULATIONS FOR MALES AND FEMALES, AGES 9-18

- MALE:
  - 88.5-(61.9*AGE)+ PA*(26.7*WT[kg] +903*HT[m]) +25

- FEMALE:
  - 135.3-(30.8*AGE)+PA*(10*WT[kg] +934*HT[m]) +25
EER CALCULATIONS FOR ADULT MALES AND FEMALES

**MALES**

- $662-(9.53 \times \text{AGE}) + \text{PA} \times (15.91 \times \text{WT[kg]} + 539.6 \times \text{HT[m]})$

**FEMALES**

- $354-(6.91 \times \text{AGE}) + \text{PA} \times (9.36 \times \text{WT[kg]} + 726 \times \text{HT[m]})$
Definitions

- Deficiency: lack of nutrients
  - biochemical deficiency symptoms
    - nutrition deficiency symptoms measured in blood or urine (such as low levels of a nutrient or enzyme activities)
    - clinical symptoms appear as a result of severe or prolonged lack of nutrients (changes seen in physical examination in skin, hair, nails, tongue, and eyes.)
Definitions, cont

- Overnutrition: nutritional intake exceeds needs.
- Undernutrition: nutritional intake falls below needs to maintain health, results from long-term reductions in nutrients.
Macronutrients

- Carbohydrates
- Proteins
- Fats (lipids)
Major Functions of Macronutrients, cont

- Important for growth and development
- Act to keep body functioning normally
Major Functions of Macronutrients

- Provide energy (kcalorie)
  - Kcal: measure of the amount of heat needed to raise the temperature of 1000 grams (1 liter) of water to 1 degree C. (approximately the same as 4 cups of water to 2 degrees F)
Assessment of Nutrient Intake

- **Dietary Reference Intakes (DRIs)**
  - Reference values that are quantitative of nutrient intakes to be used for planning and assessing diets for healthy people.

- **Recommended Dietary Allowance (RDAs)**
  - Recommended nutrient intakes that meet the needs of essentially all people of similar age and gender.

- **Estimated Average Requirement (EARs)**
  - Estimated nutrient intakes that meet the needs of essentially all people of similar age and gender.
Assessment of Nutrient Intake, cont

- **Adequate Intakes (AIs)**
  - Adequate intake to maintain health

- **Estimated Energy Requirements (EERs)**
  - Set for daily energy requirements based on defined levels of activity (Different from RDA)

- **Upper levels (ULs)**
  - The maximum level of daily nutrient intake that is likely to pose no risk or adverse effects
Current American Dietary Guidelines

- Recommendations:
  - 55% of total kcals to come from carbohydrates
    - Sugars no more than 10%
  - 15% of total kcals to come from proteins
  - 30% or less to come from fat
Macronutrient recommendations for children ages 1-3

- Fat: 30-40% of total Kcals
- Protein: 1.10 grams/kg body weight/day or approximately 13 grams of protein/day
- Carbohydrate: 130 grams/day (45-65% total Kcals/day)
- Adequate fiber: AI = 14 grams of fiber/1000 Kcal or approximately 19 grams/day
Nutrition Concerns for children ages 1-3

- Vitamins A, C, and E (vegetables, fruit, grains)
- Calcium (milk) (AI=500mg/day)
- Iron (lean meats, eggs and iron fortified cereals)
Macronutrient recommendations for children ages 4-5 years

- Fat: 25-35% of total Kcals
- Protein: 0.95 grams/kg body weight or approximately 19 grams/day
- Carbohydrate: 130 grams/day or about 45-65% of total energy intake, kcals
- 14 grams/1000Kcals
Nutrition Concerns of children ages 4-5 years

- Vitamins A, C and E
- Calcium (AI = 800mg/day)
- Zinc
- Iron
- Fluid intake (1.7 liters or 7 cups)
Macronutrient Recommendations for children ages 6-13 years

- Fat: 25-35% total energy intake, Kcals
- Protein: 0.95 grams/kg body weight/day
- Carbohydrates: 45-65% total energy intake, Kcals
- Fiber: 14 grams/1000Kcal
Nutrition Concerns for children ages 6-13 years

- Vitamins A, C, and E
- Calcium {800 mg (ages 6-8)– 1300mg(ages 9-13)}
- Zinc (5-8 mg/day)
- Fluid (1.7-2.4 liters/day)
- Iron (10mg -8mg/day)
Macronutrient recommendations for Adolescents, ages 14-18 years

- Fat: 25-35% total energy intake, Kcals
- Protein: 0.85 grams/kg body weight
- Carbohydrate: 130 grams/day
- Fiber: 26 grams/day
Nutrition Concerns for adolescents ages 14-18 years

- Calcium (1300mg/day)
- Iron (boys=11 mg/day, girls = 15mg/day)
- Vitamin A (boys = 900µg/day, girls = 700µg/day)
- Fluid needs: 11 cups/day
  - Note: growth spurt needs begin
    - Males: 12-13 years
    - Females: 10-11 years
ADA exchange system

- Designed as a quick way to estimate total kcals, carbohydrate, protein, and fat intake.
- Six different categories:
  - milk
  - fruit
  - vegetables
  - starch/bread
  - meat
  - fat
Milk (serving size 1 cup)

<table>
<thead>
<tr>
<th>Carbohydrate (grams)</th>
<th>Protein (grams)</th>
<th>Fat (grams)</th>
<th>Kcalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>8</td>
<td>Skim: trace</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lowfat: 5</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whole: 8</td>
<td>150</td>
</tr>
</tbody>
</table>
Fruit (serving size 1 small)

<table>
<thead>
<tr>
<th>Carbohydrate (grams)</th>
<th>Protein (grams)</th>
<th>Fat (grams)</th>
<th>Kcalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

Source Undetermined
Vegetable (serving size ½ - 1 cup)

<table>
<thead>
<tr>
<th>Carbohydrate (grams)</th>
<th>Protein (grams)</th>
<th>Fat (grams)</th>
<th>Kcalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>
Starch/Bread (1 slice, \(\frac{3}{4}\) c raw, \(\frac{1}{2}\) cooked)

<table>
<thead>
<tr>
<th>Carbohydrate (grams)</th>
<th>Protein (grams)</th>
<th>Fat (grams)</th>
<th>Kcalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>3</td>
<td>Trace</td>
<td>80</td>
</tr>
</tbody>
</table>

Source Undetermined
Fat (1 teaspoon)

<table>
<thead>
<tr>
<th>Carbohydrate (grams)</th>
<th>Protein (grams)</th>
<th>Fat (grams)</th>
<th>Kcalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source Undetermined
Exchange food patterns (total Kcals: 55% CHO, 30% fat, 15% protein)

<table>
<thead>
<tr>
<th>Kcal/day</th>
<th>1200</th>
<th>1600</th>
<th>2000</th>
<th>2400</th>
<th>2800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk (lowfat)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Vegetables</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Fruit</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Starch/Bread</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Meat (medfat)</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Fat</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>
### Grains
- Make half your grains whole
  - Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day
  - 1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or 1/2 cup of cooked rice, cereal, or pasta

### Vegetables
- Vary your veggies
  - Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens
  - Eat more orange vegetables like carrots and sweetpotatoes
  - Eat more dry beans and peas like pinto beans, kidney beans, and lentils

### Fruits
- Focus on fruits
  - Eat a variety of fruit
  - Choose fresh, frozen, canned, or dried fruit
  - Go easy on fruit juices

### Milk
- Get your calcium-rich foods
  - Go low-fat or fat-free when you choose milk, yogurt, and other milk products
  - If you don’t or can’t consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages

### Meat & Beans
- Go lean with protein
  - Choose low-fat or lean meats and poultry
  - Bake it, broil it, or grill it
  - Vary your protein routine – choose more fish, beans, peas, nuts, and seeds

---

For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

- Eat 6 oz. every day
- Eat 2 1/2 cups every day
- Eat 2 cups every day
- Get 3 cups every day; for kids aged 2 to 8, it’s 2
- Eat 5 1/2 oz. every day

---

**Find your balance between food and physical activity**
- Be sure to stay within your daily calorie needs.
- Be physically active for at least 30 minutes most days of the week.
- About 60 minutes a day of physical activity may be needed to prevent weight gain.
- For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required.
- Children and teenagers should be physically active for 60 minutes every day, or most days.

**Know the limits on fats, sugars, and salt (sodium)**
- Make most of your fat sources from fish, nuts, and vegetable oils.
- Limit solid fats like butter, stick margarine, shortening, and lard, as well as foods that contain these.
- Check the Nutrition Facts label to keep saturated fats, trans fats, and sodium low.
- Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients.

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U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005
CNPP-15

MyPyramid.gov
USDA

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United States Government Works
PD-0000
# MyPyramid

## Food Intake Patterns

This suggested amounts of food to consume from the basic food groups, subgroups, and combinations of foods will vary according to the number of calories, nutrients, and other food components your body needs. The table also shows the discretionary calorie allowance that can be accommodated within each color group, in addition to the suggested amounts of nutrient-dense items of foods in each group.

### Daily Amounts of Food from Each Group

<table>
<thead>
<tr>
<th>Calories/Day</th>
<th>1,000</th>
<th>1,200</th>
<th>1,400</th>
<th>1,600</th>
<th>1,800</th>
<th>2,000</th>
<th>2,200</th>
<th>2,400</th>
<th>2,600</th>
<th>2,800</th>
<th>3,000</th>
<th>3,200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1.5 cup</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td>4.5 cups</td>
<td>5 cups</td>
<td>5.5 cups</td>
<td>6 cups</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td>4.5 cups</td>
<td>5 cups</td>
<td>5.5 cups</td>
<td>6 cups</td>
</tr>
<tr>
<td>Fruits</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td>4.5 cups</td>
<td>5 cups</td>
<td>5.5 cups</td>
<td>6 cups</td>
</tr>
<tr>
<td>Meat &amp; Beans</td>
<td>2.5 oz</td>
<td>3 oz</td>
<td>3.5 oz</td>
<td>4 oz</td>
<td>4.5 oz</td>
<td>5 oz</td>
<td>5.5 oz</td>
<td>6 oz</td>
<td>6.5 oz</td>
<td>7 oz</td>
<td>7.5 oz</td>
<td>8 oz</td>
</tr>
<tr>
<td>Grains</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td>4.5 cups</td>
<td>5 cups</td>
<td>5.5 cups</td>
<td>6 cups</td>
<td>6.5 cups</td>
<td>7 cups</td>
<td></td>
</tr>
<tr>
<td>Oils</td>
<td>2 tsp</td>
<td>2.5 tsp</td>
<td>3 tsp</td>
<td>3.5 tsp</td>
<td>4 tsp</td>
<td>4.5 tsp</td>
<td>5 tsp</td>
<td>5.5 tsp</td>
<td>6 tsp</td>
<td>6.5 tsp</td>
<td>7 tsp</td>
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</tr>
<tr>
<td>Discretionary</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>3 cups</td>
<td>3.5 cups</td>
<td>4 cups</td>
<td></td>
</tr>
</tbody>
</table>

1. Calorie levels are based on a wide range to accommodate the needs of different individuals. The attached table, "Suggested Daily Amounts of Food," can be used to help assign adults to the food intake pattern at a particular calorie level.

2. Fruit Group includes all fresh, frozen, canned, and dried fruits and whole grains. In general, 1 cup of fruit, or 100% fruit juice, or 1/2 cup of dried fruit can be considered as 1 cup from the fruit group.

3. Vegetable Group includes all fresh, frozen, canned, and dried vegetables, and vegetable juice. In general, 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens, can be considered as 1 cup from the vegetable group.

4. Grain Group includes all foods made from wheat, rice, corn, or other cereal grains such as bread, pasta, rice, corn, and other cereal products. Rolls, breads, corn, and other cereal products are considered 1 ounce equivalent from the grain group. At least half of all grains consumed should be whole grains.

5. Intake of Beans Group is based on 1 ounce of beans, legumes, or peanut butter, 1/4 cup cooked dry beans, or 1/2 cup of cooked legumes, or cooked legumes can be considered as 1 ounce equivalent from the meat and beans group.
# Sample Menus for a 2000 Calorie Food Pattern

**Average adult 1 week, 2,000 calorie day.** (Eating this amount of foods provides all of the recommended amounts of nutrients and food from each food group. Individual foods are part of the diet of adults that are active.)

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BREAKFAST</strong></td>
<td><strong>BREAKFAST</strong></td>
<td><strong>BREAKFAST</strong></td>
<td><strong>BREAKFAST</strong></td>
</tr>
<tr>
<td>Breakfast cereal</td>
<td>Breakfast cereal</td>
<td>Breakfast cereal</td>
<td>Breakfast cereal</td>
</tr>
<tr>
<td>1/2 cup roll (77g)</td>
<td>1/2 cup fruit (89g)</td>
<td>1/2 cup fruit (89g)</td>
<td>1/2 cup fruit (89g)</td>
</tr>
<tr>
<td>1/2 cup milk (243g)</td>
<td>1/2 cup milk (243g)</td>
<td>1/2 cup milk (243g)</td>
<td>1/2 cup milk (243g)</td>
</tr>
<tr>
<td>1 cup orange juice</td>
<td>1 cup orange juice</td>
<td>1 cup orange juice</td>
<td>1 cup orange juice</td>
</tr>
<tr>
<td><strong>LUNCH</strong></td>
<td><strong>LUNCH</strong></td>
<td><strong>LUNCH</strong></td>
<td><strong>LUNCH</strong></td>
</tr>
<tr>
<td>Roast beef sandwich</td>
<td>Roast beef sandwich</td>
<td>Roast beef sandwich</td>
<td>Roast beef sandwich</td>
</tr>
<tr>
<td>1 whole grain sandwich bun</td>
<td>1 whole grain sandwich bun</td>
<td>1 whole grain sandwich bun</td>
<td>1 whole grain sandwich bun</td>
</tr>
<tr>
<td>1/2 cup lean ham or roast beef</td>
<td>1/2 cup lean ham or roast beef</td>
<td>1/2 cup lean ham or roast beef</td>
<td>1/2 cup lean ham or roast beef</td>
</tr>
<tr>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
</tr>
<tr>
<td>1 small tomato</td>
<td>1 small tomato</td>
<td>1 small tomato</td>
<td>1 small tomato</td>
</tr>
<tr>
<td>1/2 cup finely chopped white meat</td>
<td>1/2 cup finely chopped white meat</td>
<td>1/2 cup finely chopped white meat</td>
<td>1/2 cup finely chopped white meat</td>
</tr>
<tr>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
</tr>
<tr>
<td><strong>DINNER</strong></td>
<td><strong>DINNER</strong></td>
<td><strong>DINNER</strong></td>
<td><strong>DINNER</strong></td>
</tr>
<tr>
<td>Grilled chicken breast</td>
<td>Grilled chicken breast</td>
<td>Grilled chicken breast</td>
<td>Grilled chicken breast</td>
</tr>
<tr>
<td>1/2 cup brown rice</td>
<td>1/2 cup brown rice</td>
<td>1/2 cup brown rice</td>
<td>1/2 cup brown rice</td>
</tr>
<tr>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
</tr>
<tr>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
<td>1/2 cup mixed vegetables</td>
</tr>
<tr>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
<td>1/2 cup orange juice</td>
</tr>
<tr>
<td><strong>SNACKS</strong></td>
<td><strong>SNACKS</strong></td>
<td><strong>SNACKS</strong></td>
<td><strong>SNACKS</strong></td>
</tr>
<tr>
<td>1/4 cup dried apricots</td>
<td>1/4 cup dried apricots</td>
<td>1/4 cup dried apricots</td>
<td>1/4 cup dried apricots</td>
</tr>
<tr>
<td>1/4 cup pineapple</td>
<td>1/4 cup pineapple</td>
<td>1/4 cup pineapple</td>
<td>1/4 cup pineapple</td>
</tr>
</tbody>
</table>
# Food Guide Pyramid

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk, yogurt, And cheese</td>
<td>2 adult 3 children, Pregnant or lactating women</td>
<td>Carbohydrate Calcium Riboflavin Protein Potassium Zinc</td>
<td>1 C milk 11/2 oz cheese 1 c yogurt 2 cups cottage cheese</td>
</tr>
</tbody>
</table>
### Food Guide Pyramid, cont

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
</table>
| Meat, poultry, fish, dry beans, eggs, nuts | 2 -3    | Protein, Niacin, Iron, Vitamin B6, B12, Zinc, Thiamin | 2-3 oz cooked meat  
1-1 ½ c cooked dry beans  
2 T peanut butter  
2 eggs  
½ - 1 c nuts |
## Food Guide Pyramid, cont

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>2 - 4</td>
<td>Carbohydrate, Vitamin C, Dietary Fiber</td>
<td>¼ c dried, ½ c cooked, ¾ cup juice, 1 small, 1 melon wedge</td>
</tr>
</tbody>
</table>
## Food Guide Pyramid, cont

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>3 - 5</td>
<td>Carbohydrate, Vitamin A, Vitamin C, Folate, Magnesium, Dietary fiber</td>
<td>½ c raw or cooked, 1 c raw leafy</td>
</tr>
</tbody>
</table>
## Food Guide Pyramid, cont

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread, Cereal, Rice, Pasta</td>
<td>6-11</td>
<td>Carbohydrate, Thiamin, Riboflavin, Iron, Niacin, Folate, Zinc, Magnesium, Dietary Fiber</td>
<td>1 sl bread, 1 oz dry cereal, ½-3/4 c cooked cereal, rice, pasta, 3-4 small crackers</td>
</tr>
</tbody>
</table>
### Food Guide Pyramid, cont

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Serving</th>
<th>Major contributions</th>
<th>Foods/ Serving sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fats, Oils, And Sweets</td>
<td>Based on individual energy needs.</td>
<td>Foods from this group should not replace any from the other groups.</td>
<td>Use sparingly</td>
</tr>
</tbody>
</table>
Food Guide Pyramid vs ADA Exchange List

- **Food Guide Pyramid**
  - recommendations based on approximately 2,500 kcal intake/day
  - based on nutrient needs (vitamins/minerals)

- **ADA Exchange List**
  - lists based on total kcal intake
  - based on modulating carbohydrate, protein, and fat intake
Image of “Digestion in Process” cartoon removed

Original source: www.offthemark.com

Mark Parisi’s Nov. 23, 1992 cartoon on digestion
Carbohydrate Recommendations

- RDA: 130 g/day for adults
- 50-100 g/day to prevent ketosis
  - 1 orange juice = 25g, 1 apple = 20
- DRI: 45-60% from total Carbohydrate
- Fiber: general recommendation 20-35 grams/day
  - New guidelines:
    - Under 50 yrs old: Men 38 g/day, Women 25 g/day
    - Over 50 yrs old: Men 30g/day, Women 21 g/day
Example of a 25-gram Fiber Diet (1500 Kcal)

- **Breakfast**
  - Orange Juice, 1 c
  - Wheaties, ¾ c
  - 1% Milk, 1/2c
  - Whole Wheat toast, 1 sl
  - Coffee

- **Lunch**
  - Lean turkey
  - Whole Wheat bread, 2 sl
  - Baked Beans, 1/2c
  - Mayonnaise, 2 tsp
  - Lettuce, ¼ c
  - Pear, with skin

Fiber g

<table>
<thead>
<tr>
<th>Item</th>
<th>Fiber g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange Juice</td>
<td>1.0</td>
</tr>
<tr>
<td>Wheaties</td>
<td>3.0</td>
</tr>
<tr>
<td>1% Milk</td>
<td>1.9</td>
</tr>
<tr>
<td>Whole Wheat toast</td>
<td>1.9</td>
</tr>
<tr>
<td>Coffee</td>
<td></td>
</tr>
<tr>
<td>Lean turkey</td>
<td></td>
</tr>
<tr>
<td>Whole Wheat bread</td>
<td>3.8</td>
</tr>
<tr>
<td>Baked Beans</td>
<td>3.5</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td></td>
</tr>
<tr>
<td>Lettuce</td>
<td>0.2</td>
</tr>
<tr>
<td>Pear, with skin</td>
<td>4.3</td>
</tr>
</tbody>
</table>
## 25 g Fiber Diet, cont

<table>
<thead>
<tr>
<th>Dinner</th>
<th>Fiber g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broiled chicken (no skin), 3oz</td>
<td></td>
</tr>
<tr>
<td>Baked Potato, with skin, 1 lg</td>
<td>3.6</td>
</tr>
<tr>
<td>Margarine/butter, 1 1/2tsp</td>
<td></td>
</tr>
<tr>
<td>Green Beans, 1 c</td>
<td>2.0</td>
</tr>
<tr>
<td>1% milk, 1 c</td>
<td></td>
</tr>
<tr>
<td>Apple, with peel, 1 med</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Total fiber grams =</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>
Calculation of Dietary Intake of Carbohydrate Kcals

1). Calculate total grams of Carbohydrate intake.
   - Note: did you meet the RDA?
   - Note: did you consume 50-100 g and prevent ketosis?

2). Multiply total grams of carbohydrate x 4 = total kcals of carbohydrate intake
Examples of Low-Carbohydrate Diets

- Dr. Atkins, Dr. Stillman, Calories don’t Count, Scarsdale Diet, Drinking mans diet,
- Four day wonder diet, Air Force diet, Sugar Busters, The zone, etc.
Historical Low-Carbohydrate Diet

- William Banting
  - Letter on Corpulence, 1864.

- William Harvey’s 1872 publication “On corpulence in relation to disease, with some remarks on diet.”
Typical Menu

- Breakfast: 4-5 ounces of beef, mutton, kidneys, broiled fish, bacon, or cold meat of any kind but pork.
  - 1 small biscuit or 1 ounce of dry toast, 1 large cup tea without milk or sugar.
- Lunch: 5-6 ounces of any fish except salmon, any meat except pork, any vegetable except potato
- Any kind of poultry or game. 1 ounce of dry toast. Fruit 2-3 glasses of good claret, or sherry. 2-3 ounces of fruit. 1-2 rusks (cut from bread and re-baked). 1 cup tea without milk or sugar.
- Supper: 3-4 ounces of any meat except pork, any fish except salmon, 1-2 glasses of claret.
- Night-cap: 1 tumbler of grog(gin, whiskey or brandy without sugar added) or 1-2 glasses of claret or sherry.
Dietary Guidelines for Americans, 2005

- Food Groups to Encourage:
  - 2 cups of fruit and 2 1/2 cups of vegetables/day (based on 2000 kcal/day)
    - Choose a variety from all 5 subgroups:
      - Dark green, orange, legumes, starchy vegetables, and other vegetables)
  - Consume 3 or more ounce equivalents of whole-grain products/day
  - Consume 3 cups /day of fat-free milk or equivalent milk products.
Fruits and Vegetables

- =9 servings/day
  - Recommended weekly
    - Dark green vegetables 3 cups/week
    - Orange vegetables 2 cups/week
    - Legumes 3 cups/week
    - Starchy Vegetables 3 cups/week
    - Other vegetables 61/2 cups/week
DASH Diet

- Dietary Approaches to Stop Hypertension
- Recommended in Dietary Guidelines for Americans, 2005
The DASH eating plan shown below is based on 2,000 calories a day. The number of daily servings in a food group may vary from those listed, depending on your caloric needs. Use this chart to help you plan your menus or take it with you when you go to the store.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Daily Servings (except as noted)</th>
<th>Serving Sizes</th>
<th>Examples and Notes</th>
<th>Significance of Each Food Group to the DASH Eating Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains and grain products</td>
<td>7-8</td>
<td>1 slice bread</td>
<td>Whole wheat bread, English muffin, English</td>
<td>Major sources of energy and fiber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 oz dry cereal*</td>
<td>muffin, English bagel, cereals, grits,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ cup cooked rice, pasta, cereal</td>
<td>oatmeal, crackers, unsalted pretzels and popcorn</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>4-5</td>
<td>1 cup raw leafy vegetable</td>
<td>Tomatoes, potatoes, carrots, green</td>
<td>Rich sources of potassium, magnesium, and fiber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ cup cooked vegetable</td>
<td>peas, squash, broccoli, turnip greens, collards,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 oz vegetable juice</td>
<td>kale, spinach, artichokes, green beans, lime</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>beans, sweet potatoes</td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td>4-5</td>
<td>6 oz fruit juice</td>
<td>Apricots, bananas, dates, grapes, oranges,</td>
<td>Important sources of potassium, magnesium, and fiber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 medium fruit</td>
<td>orange juice, grapefruit, grapefruit juice,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ cup dried fruit</td>
<td>mangoes, melons, peaches, pineapples, prunes,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ cup fresh, frozen, or canned fruit</td>
<td>raisins, strawberries, tangerines</td>
<td></td>
</tr>
<tr>
<td>Lowfat or fat free dairy foods</td>
<td>2-3</td>
<td>8 oz milk</td>
<td>Fat free (skim) or lowfat (1%) milk, fat free</td>
<td>Major sources of calcium and protein</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 cup yogurt</td>
<td>or lowfat buttermilk, fat free or lowfat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1½ oz cheese</td>
<td>regular or frozen yogurt, lowfat and fat free</td>
<td></td>
</tr>
<tr>
<td>Meats, poultry, and fish</td>
<td>3 or less</td>
<td>3 oz cooked meats, poultry, or fish</td>
<td>Select only lean; trim away visible fats;</td>
<td>Rich sources of protein and magnesium</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>broil, roast, or boil, instead of frying;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>remove skin from poultry</td>
<td></td>
</tr>
<tr>
<td>Nuts, seeds, and dry beans</td>
<td>4-5 per week</td>
<td>¼ cup or 1½ oz nuts</td>
<td>Almonds, filberts, mixed nuts, peanuts,</td>
<td>Rich sources of energy, magnesium, potassium, protein,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 tbsp or 1½ oz seeds</td>
<td>walnuts, sunflower seeds, kidney beans, lentils,</td>
<td>and fiber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ cup cooked dry beans peas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fats and oils</td>
<td>2-3</td>
<td>1 tsp soft margarine</td>
<td>Soft margarine, lowfat mayonnaise, light salad</td>
<td>DASH has 27 percent of calories as fat, including fat in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 tbsp lowfat mayonnaise</td>
<td>dressing, vegetable oil (such as olive, corn,</td>
<td>or added to foods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 tbsp light salad dressing</td>
<td>canola, or safflower)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 tsp vegetable oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweets</td>
<td>5 per week</td>
<td>1 tbsp sugar</td>
<td>Maple syrup, sugar, jelly, jam, fruit-flavored</td>
<td>Sweets should be low in fat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 tbsp jelly or jam</td>
<td>gelatin, jelly beans, hard candy, fruit punch,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>½ oz jelly beans</td>
<td>sorbet, ices</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 oz lemonade</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Equals 1/2 – 1 1/4 cups, depending on cereal type. Check the product’s Nutrition Facts Label.

† Fat content changes serving counts for fats and oils. For example, 1 tbsp of regular salad dressing equals 1 serving; 1 tbsp of a lowfat dressing equals 1/2 serving; 1 tbsp of a fat-free dressing equals 0 servings.
Additional Source Information
for more information see: http://open.umich.edu/wiki/CitationPolicy

Slide 7: Source Undetermined
Slide 8: Source Undetermined
Slide 23: Virginia Uhley
Slide 43: Source Undetermined
Slide 44: Source Undetermined
Slide 45: Source Undetermined
Slide 46: Source Undetermined
Slide 47: Source Undetermined
Slide 48: Source Undetermined