



1  **FDNTR 219 - Nutrition**

2  **What is Nutrition?**

The science of:

- Food, nutrients and the substances they contain
- Actions and interactions in the body to sustain and improve health
 - Ingestion
 - Digestion, Transport, and Absorption
 - Metabolism
 - Storage
 - Excretion

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3  **Why is Nutrition Important?**

4  **Why Do We Eat The Food That We Eat?**

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6  **Why Do We Eat The Food That We Eat?**

- Preference and Taste
- Cost and Convenience
- Habits
- Ethnicity and Traditions
- Social Interactions
- Positive and Negative Associations
- Comfort
- Values
- Beliefs
- Body Weight, Body Image
- Nutrition and Health Benefits

7  **The Nutrients**

- Energy Yielding
 - Carbohydrates
 - Protein
 - Lipids
- Non Energy Producing
 - Vitamins
 - Minerals
 - Water

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8  **Carbohydrates**

- Energy Yielding Organic Compound
- Major Fuel Source for the Body'
- Sources
 - Simple Carbohydrates
 - Sugars
 - Complex Carbohydrates
 - Glycogen and Starches
 - Fiber
- Provide 4 Kcal/gm

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9  **Protein**

- Organic compounds with nitrogen bases

- Consist of a multitude of amino acids

– 9 essential; 11 non-essential

- Make hormones, enzymes, antibodies
- Maintains immune function
- Maintain fluid and acid/base balance
- Grow, repair, and replace tissue

• Provide 4 Kcal/gm

10  **Lipids**

- Family of compounds consisting of:
 - Triglycerides (fats and oils)
 - Phospholipids (lecithin)
 - Sterols (cholesterol; plant sterols)
- Provide essential fatty acids
- Provide fat soluble vitamins
- Provide insulation to the body and cells
- Help to provide cell structure
- Add flavor to foods and increase satiety
- Provide 9 Kcal/gm

11  **Vitamins**

- Organic Compounds
- Two Categories
 - Water Soluble: B vitamins & vitamin C
 - Fat Soluble: A, D, E, and K
- Enable chemical reactions to occur
- Do not provide energy to the body
- Currently investigated for role in disease prevention, rather than to cure deficiencies

12  **Minerals**

- Inorganic compounds
- Important for metabolic processes and structural systems
- Major Minerals
- Trace Minerals

13  **Water**

- Vital as a solvent and lubricant
- Transport nutrients and waste products
- Maintain body temperature
- Participate in chemical reactions

14  **Energy**

- Comes from energy yielding nutrients
- Measured in Calories or Kilocalories
The amount of heat to raise 1000 gms (1 Liter) of water 1 degree Celcius
- Food energy:
 - Carbohydrates: 4 kcals/gm
 - Protein: 4 kcals/gm
 - Lipids: 9 kcals/gm
 - Alcohol: 7 kcals/gm

15  **Determining Nutrient Requirements**

- Recommendations based on quality nutrition research
- Valid Study Designs include:
 - Epidemiological studies
 - Experimental studies
 - Animal, lab, or human
 - Large sample sizes used
 - Double blind
- Acceptance based on replication and peer review

16  **Epidemiological Studies**

- Cross Sectional
 - Review types and amount of foods consumed
 - Example: Mediterranean diet
- Case Control
 - Compare specific differences in expression of disease
 - Vitamin C and Scurvy
- Cohort
 - Compare data from a selected group over a period of time
 - Framingham Study

17  **Experimental Studies**


- Laboratory Animal Studies
 - Controlled environment to feed or omit specific nutrients
- Laboratory In-Vitro Studies
 - Review effects of variability on cell, tissue or molecule from a living organism
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- Clinical Trials
 - Voluntary participation in trials to explore investigators hypothesis
- Double Blind Studies

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22  **Can I Trust the Media to Deliver Nutrition News?**

- Read nutrition information with an educated eye
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- Consider the source of the information

– Is it from a reputable journal? A magazine? An Internet chat room? A talk show? Your mother???

- http://www.nlm.nih.gov/medlineplus/webeval/webeval_start.html
- <http://www.youtube.com/watch?v=SavsJYXWgm8>

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24  **Dietary Reference Intakes**

- Set of standards that best define the amounts of energy and nutrients required to support health

- Estimated Average Requirements (EAR)
- Recommended Dietary Allowance (RDA)
- Adequate Intake (AI)
- Tolerable Upper Intake Levels (UL)

25  **Dietary Reference Intakes**

26  **Estimated Average Requirement**

- The average amount of a nutrient that appears sufficient to maintain a specific body function in *half* of the population


– Fairly close to everyone's needs, but if one consistently consumed the EAR, half of the population would be deficient in a specific nutrient

27  **Recommended Dietary Allowances**

- Level set high enough to meet the nutrient requirements of 97.5% of a specific population

• Can be used as nutrient goals for individuals

• Enough scientific data is present to support recommendations

28  **Adequate Intake (AI)**

- If there is insufficient research and data to support development of an EAR, an AI is established

• Reflects the average amount of a nutrient that a group of healthy people consumes

• Can be used as individual nutrient goal

29  **Tolerable Upper Intake Levels (UL)**

- Highest level a nutrient is unlikely to pose a health risk

• Developed to guard against overconsumption of nutrients

30  **Energy and Macronutrient Requirements**

- Caloric requirement set to maintain a healthy weight based on age, ht, wt and physical activity

• Need to balance energy intake with output to maintain weight

• Acceptable macronutrient range (% of calories)

- 45-65 % carbohydrate
- 20-35% fat

- 10-35% protein