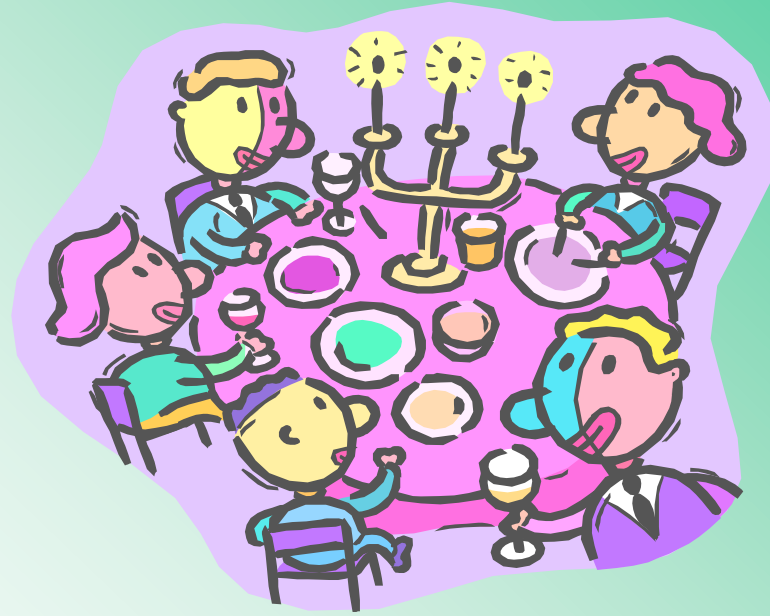


# FDNTR 219 - Nutrition



Modesto Junior College

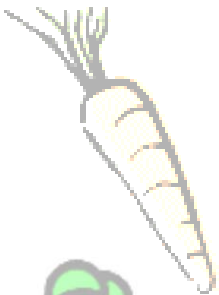
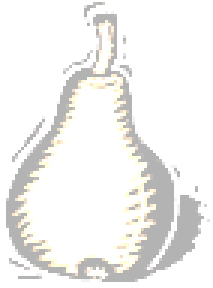
Sally Gerling, MS, RD, CDE

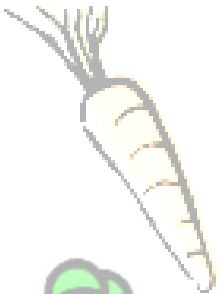
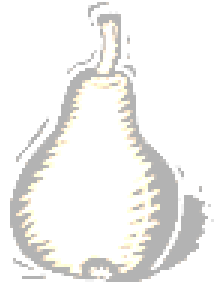


# What is Nutrition?

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



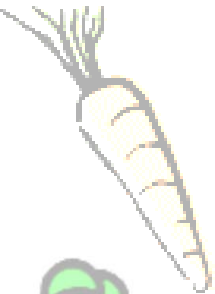
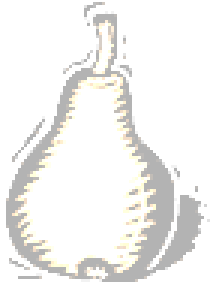


# Why is Nutrition Important?

Food provides the body with essential and non essential nutrients to:

- Ensure adequate growth and development
- Act as regulators in key metabolic reactions
- Participate in chemical reactions to provide energy
- Repair and maintain cell tissues, organs and vital body processes
- Prevent deficiency diseases
- Reduce risk of chronic diseases

# Why Do We Eat The Food That We Eat?

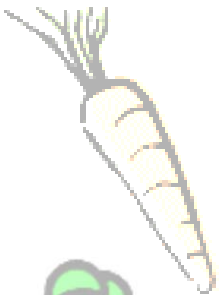
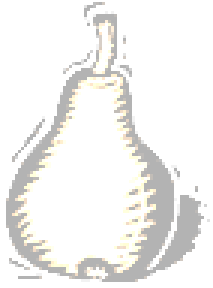


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# Why Do We Eat The Food That We Eat?

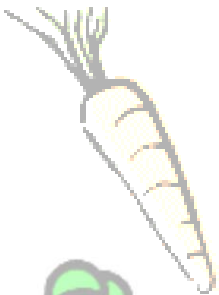
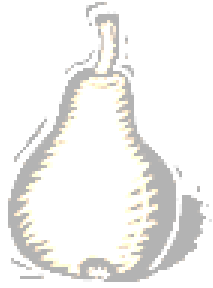


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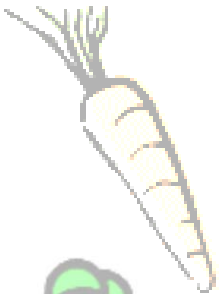
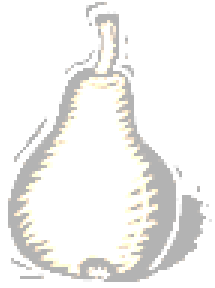
# Why Do We Eat The Food That We Eat?



- 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

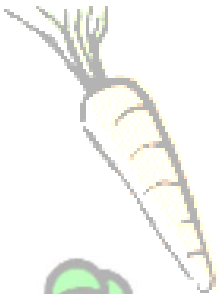
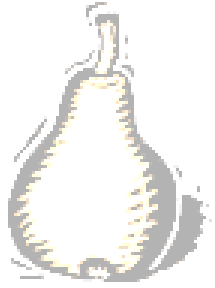
# The Nutrients

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



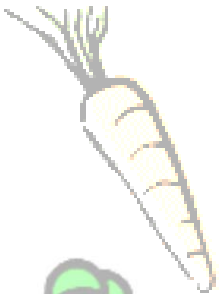
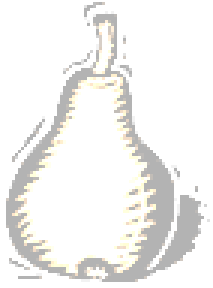
# Carbohydrates

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



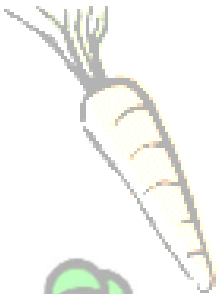
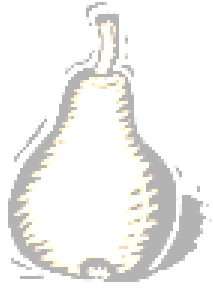
# Protein

- 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



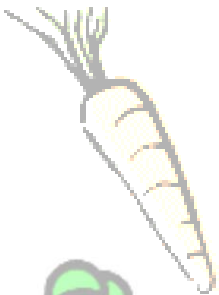
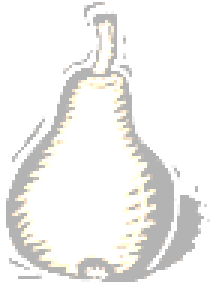
# Lipids

- 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



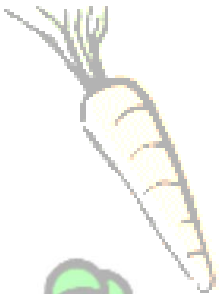
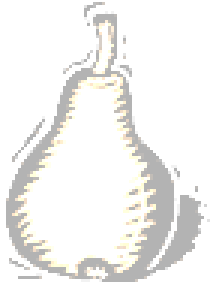
# Vitamins

- 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



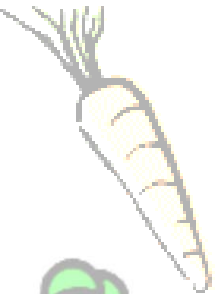
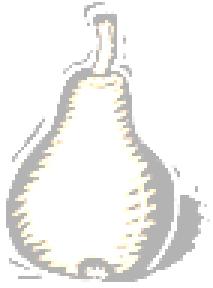
# Minerals

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



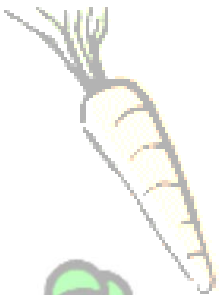
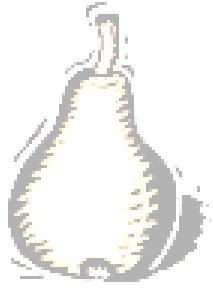
# Water

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

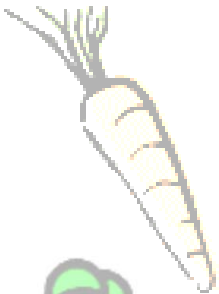
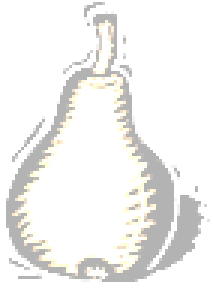


# Energy

- 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



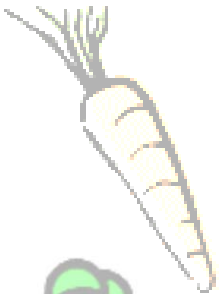
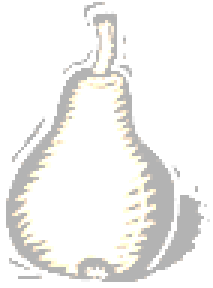
# Determining Nutrient Requirements



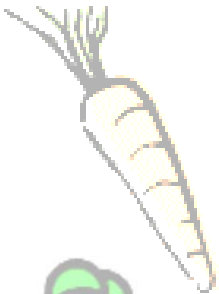
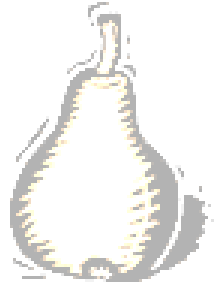
- Recommendations based on quality nutrition research
- Valid Study Designs include:
  - Epidemiological studies
  - Experimental studies
    - Animal, lab, or human
  - Large sample sizes used
  - Double blind
- Acceptance based on replication and peer review

# 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



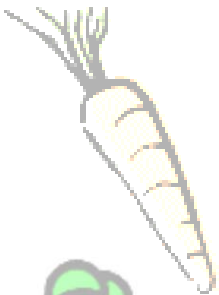
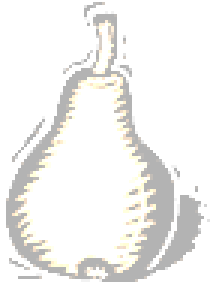
# Experimental Studies

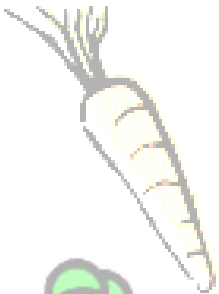
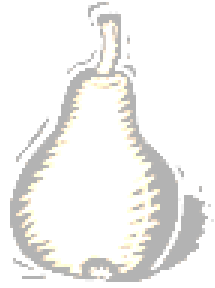


- Laboratory Animal Studies
  - Controlled environment to feed or omit specific nutrients
- Laboratory In-Vitro Studies
  - Review effects of variability on cell, tissue or molecule from a living organism
- Clinical Trials
  - Voluntary participation in trials to explore investigators hypothesis
- Double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

# Nutrition Information & Misinformation

- Registered Dietitian (RD)
  - Bachelors Degree or higher in nutrition or dietetics
  - Must pass national examination to use credential
  - Must maintain registration via continual learning
  - May call themselves nutritionist by law
- Nutritionist
  - Certified nutritionists, certified nutritional consultants, and certified nutritional therapists do not have the same credentials as an RD.
  - State of CA – anyone can call themselves a nutritionist



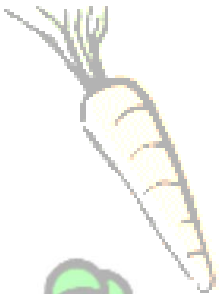
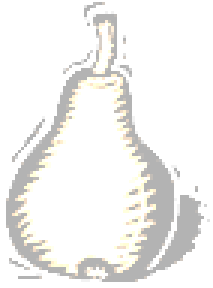


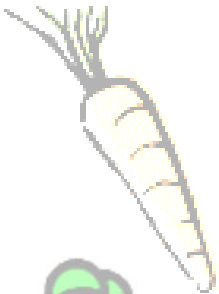
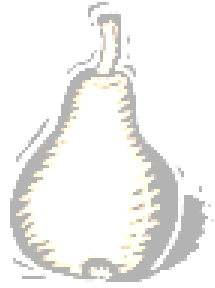
# Nutrition Information & Misinformation

- Protection from Fraud
  - Look for a degree from an accredited college or university.
  - Be careful of correspondence schools.
  - Fraudulent businesses may provide false credentials.

# Nutrition Information & Misinformation

- Nutrition on the Net
  - Internet information can be published by ANYONE.
  - May be misleading, incomplete, and inaccurate
  - High-quality information: National Library of Medicine's PubMed
- Nutrition in the News
  - Can be misleading and contradictory
  - May report scientific findings prematurely

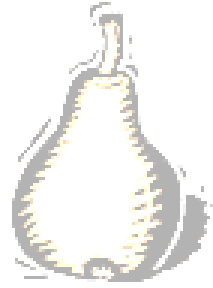




# Nutrition Information & Misinformation

- Red Flags of Nutritional Quackery
  - Satisfaction guaranteed
  - Quick and easy fixes
  - Natural
  - One product does all
  - Time tested
  - Paranoid accusations
  - Personal testimonials
  - Meaningless medical jargon

# Can I Trust the Media to Deliver Nutrition News?

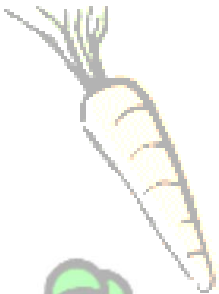
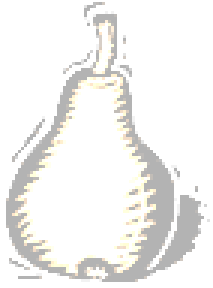


- Read nutrition information with an educated eye
- Consider the source of the information
  - Is it from a reputable journal? A magazine? An Internet chat room? A talk show? Your mother???
- [http://www.nlm.nih.gov/medlineplus/webeval/webeval\\_start.html](http://www.nlm.nih.gov/medlineplus/webeval/webeval_start.html)
- <http://www.youtube.com/watch?v=SavsJYXWgm8>

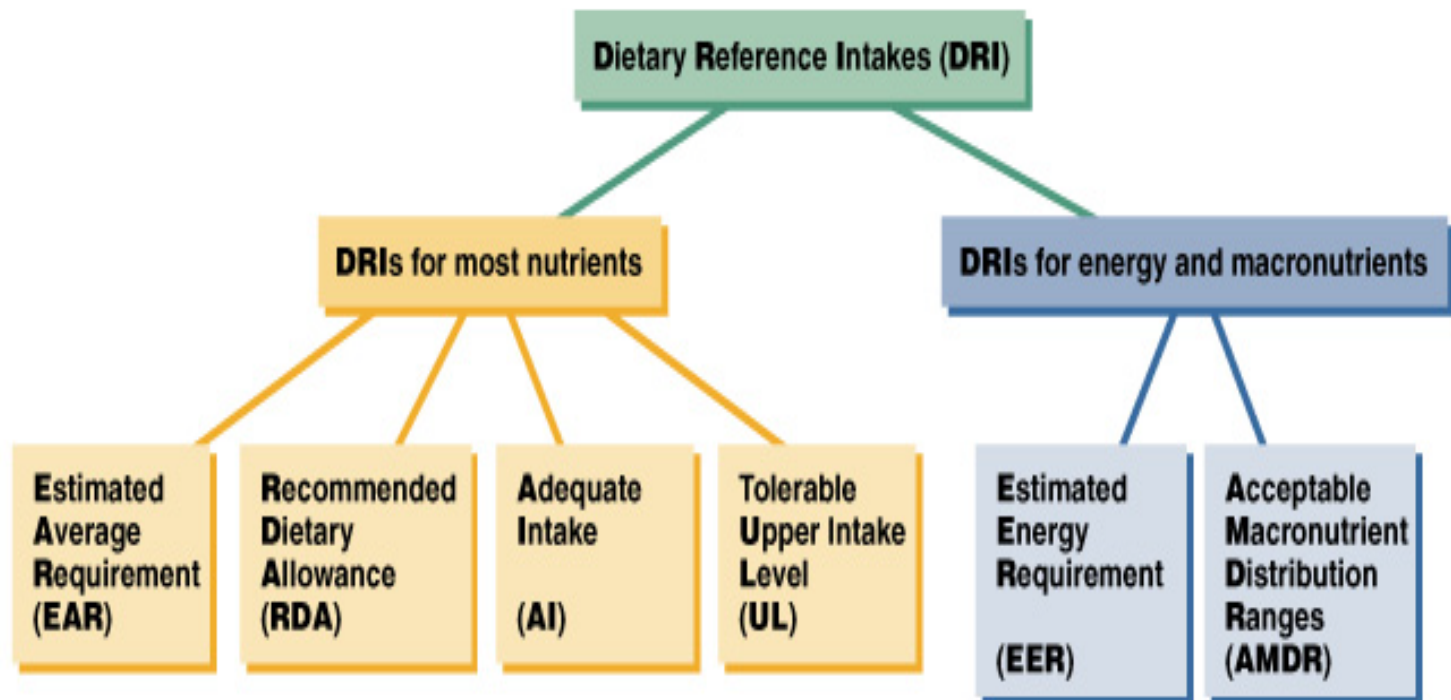


# Dietary Reference Intakes

- 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)

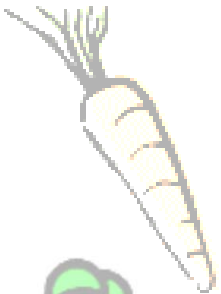
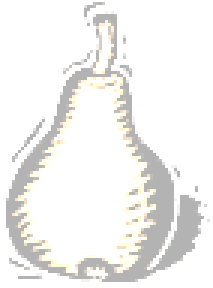


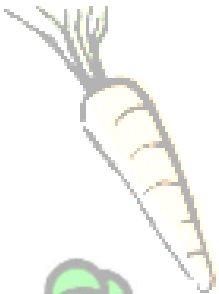
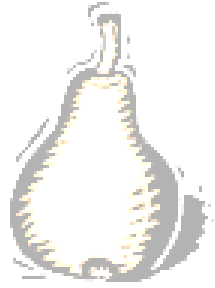
# Dietary Reference Intakes



# 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

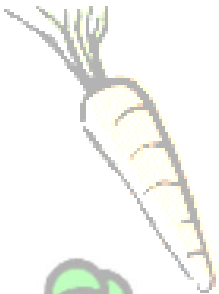
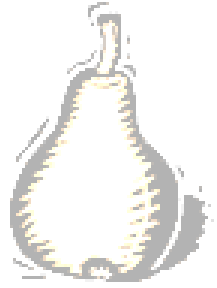




# Recommended Dietary Allowances

- 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

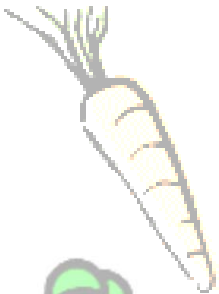
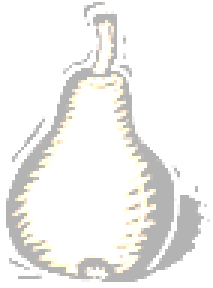
# Adequate Intake (AI)



- 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

# Tolerable Upper Intake Levels (UL)

- Highest level a nutrient is unlikely to pose a health risk
- Developed to guard against overconsumption of nutrients



# 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

