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Nutrition

Allison B. Kerin MS, RD, LD
Director
Employee Wellness and Recognition
Texas Tech University Health Sciences Center
Lubbock, Texas

Nurse Aide/Nurse Assistant I 41819

Learning Goals

- Discuss the factors that influence your food choices
- Define the term nutrition
- Differentiate between the six categories of essential nutrients found in food and in the body
- Understand the importance of a well-balanced diet in meeting your daily nutrient needs
- Discuss the current nutritional state of the American diet
- Identify how to find reliable sources of nutrition information

What is Nutrition? Why is Good Nutrition So Important?

- Nutrition: the science that studies how nutrients and compounds in foods nourish and affect body functions and health
- Chronic deficiencies, excesses, and imbalances of nutrients can affect health
- Good nutrition plays a role in reducing the risk of many chronic diseases and conditions, including heart disease, cancer, and stroke

Table 1.1

Leading Causes of Death in the United States

Disease/Cause of Death	Nutrition Related
Heart Disease	X
Cancer	X
Respiratory Diseases	
Stroke	X
Accidents	
Alzheimer's Disease	
Diabetes	X
Influenza/Pneumonia	
Kidney Disease	
Intentional Self Harm	

Source: Based on "Leading Causes of Death," Centers for Disease Control and Prevention website, 2012.

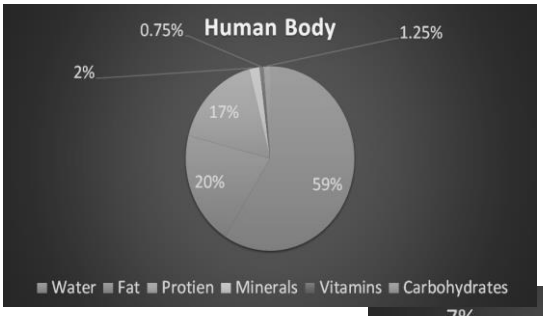
What Drives Our Food Choices?

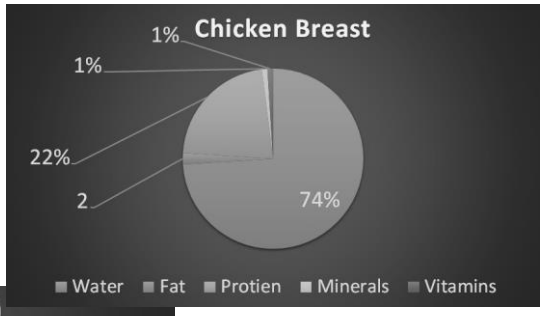
- We need to eat and drink to obtain:
  1. Nutrients: chemical compounds in foods to provide fuel for energy (measured in kilocalories), growth, and maintenance, and to regulate body processes
     - Six classes: carbohydrates, fats, protein, vitamins, minerals, water
  2. Phytochemicals: non-nutrient compounds that contribute to health and may play a role in fighting chronic diseases
- We choose foods for many other reasons beyond the basic need to obtain nutrients:
  - Taste and culture
  - Social reasons and trends
  - Cost, time, and convenience
  - Habits and emotions

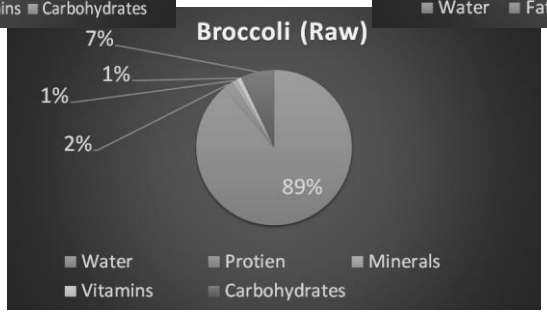
What Are the Essential Nutrients and Why Do You Need Them?

- The six classes of nutrients are all essential in the diet to maintain bodily function
- Macronutrients: energy-yielding nutrients needed in higher amounts
  - Carbohydrates, lipids (fats), and proteins
- Micronutrients: needed in smaller amounts
  - Vitamins and minerals
- Water: copious amounts needed daily for hydration

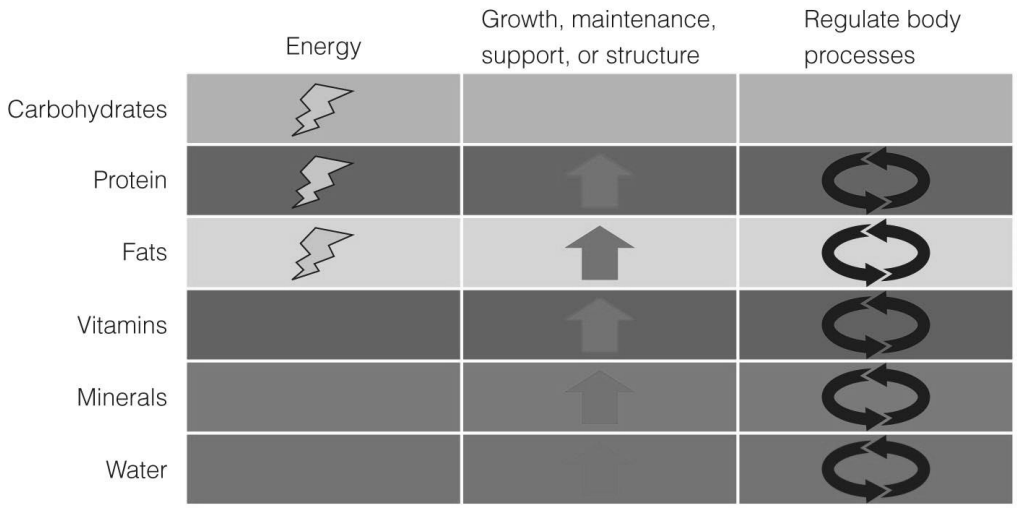
Nutrients in Foods and in the Body







Nutrients and Their Functions



What Are the Essential Nutrients and Why Do You Need Them?

- Carbohydrates, fats, and proteins
  - Provide energy
    - Carbohydrates and protein provide 4 kcal/g
    - Fats provide 9 kcal/g
  - Are organic compounds (contain carbon atoms)
  - Also contain hydrogen and oxygen atoms
  - Proteins also contain nitrogen atoms (unlike carbohydrates and fats)

To calculate the amount of energy a food provides:

- Multiply the total grams of a nutrient by the number of calories per gram
  - 1 gram of carbohydrate or protein = 4 calories
  - 1 gram of fat = 9 calories
- Carbohydrates supply glucose, a major energy source
- Fats are another major fuel source and also:
  - Cushion organs
  - Insulate body to maintain body temperature

What Are the Essential Nutrients and Why Do You Need Them?

- Proteins can provide energy but are better suited for:
  - Growth and maintenance of muscle, tissues, organs
  - Making hormones, enzymes, and a healthy immune system
  - Transporting other nutrients
- Vitamins and minerals are essential for metabolism
  - Many assist enzymes in speeding up chemical reactions in the body
    - Example: B vitamins are coenzymes in carbohydrate and fat metabolism
  - Vitamins are organic compounds
  - Minerals are inorganic substances
    - Key roles in body processes and structures
- Water is vital for many processes in your body
  - Part of fluid medium inside and outside of cells

What Are the Essential Nutrients and Why Do You Need Them?

- Helps chemical reactions, such as those involved in energy production
- Key role in transporting nutrients and oxygen to cells and removing waste products
- Lubricant for joints, eyes, mouth, and the intestinal tract
- Protective cushion for organs

How Should You Get These Important Nutrients?

The best way to meet your nutrient needs is with a well-balanced diet that includes:

- Essential nutrients from all six classes
- Fiber and phytochemicals
  - Whole grains, fruits, and vegetables are rich sources
- A supplement can be beneficial:
  - When nutrient needs are higher
    - Example: pregnant women need an iron supplement to meet increased needs
  - When diet restrictions exist
    - Example: lactose-intolerant individuals (difficulty digesting milk products) may choose a calcium supplement to help meet needs
- Well-balanced diet and supplements are not mutually exclusive; they can be partnered for good health

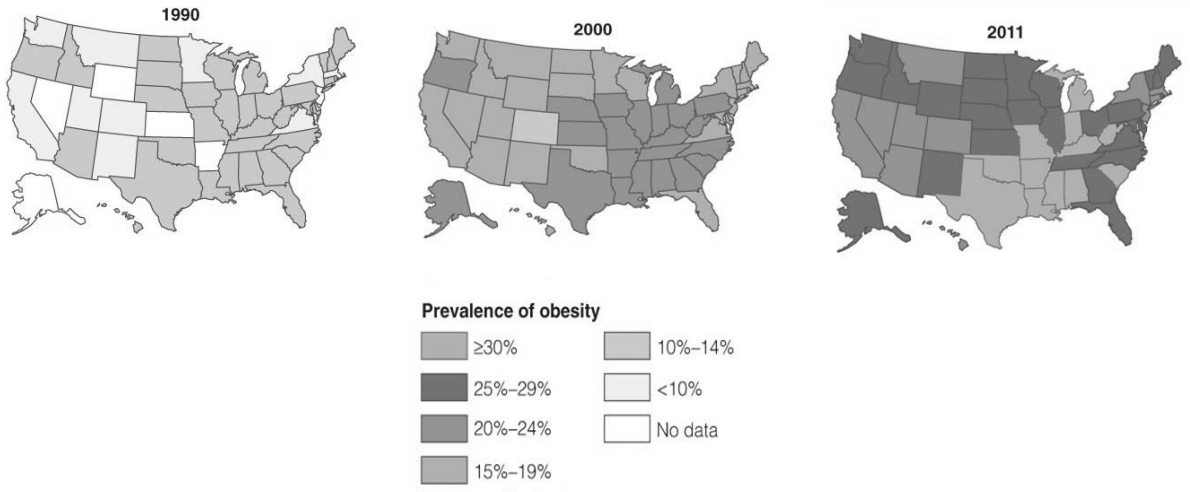
How Does the Average American Diet Stack Up?

- High in:
  - Sodium
  - Saturated fat
  - Calories
- Low in:
  - Vitamin D
  - Calcium
  - Fiber
- Incidence of overweight and obesity is on the rise
- Adults
  - 65% are overweight
  - 36% are obese
- Children
  - 12% aged 2–5 are obese
  - 18% aged 6–19 are obese

How Does the Average American Diet Stack Up?

- High rates of overweight and obesity
- Causes
  - Consume more calories than needed
    - High amounts of carbohydrates
  - Burn fewer calories due to sedentary lifestyles
- Effects
  - Increased rate of type 2 diabetes (especially children), heart disease, cancer, and stroke

Obesity Trends among U S Adults



How Does the Average American Diet Stack Up?

- Improving Americans' diets is one goal of Healthy People 2020
  - Disease prevention and health promotion objectives for Americans to meet in the second decade of twenty-first century
  - Focuses on several overarching goals:
    - Eliminate preventable disease, disability, injury, and premature death
    - Achieve health equity, eliminate disparities, and improve the health of all groups
    - Create social and physical environments that promote good health for all
    - Promote quality of life, healthy development, and healthy behaviors across every stage of life

Table 1.2

Healthy People 2020 Nutrition and Weight Status Objectives

Objectives	Target for Americans (%)	Status of Americans (%)
Increase the proportion of adults who are at a healthy weight	33.9	30.8
Reduce the proportion of adults who are obese	30.5	33.9
Reduce the proportion of children and adolescents who are considered obese	14.5	16.1
Increase the contribution of fruits to diets of the population age 2 years and older	0.9 cups/ 1,000 calories	0.5 cups/ 1,000 calories
Increase the variety and contribution of vegetables to the diets of the population age 2 years and older	1.1 cups/ 1,000 calories	0.8 cups/ 1,000 calories

Source: *Healthy People 2020*, U.S. Department of Health and Human Services, 2012.

Table 1 2

What is Healthy Eating and What Tools Can Help?

- Key principles of healthy eating:
  - Balance
  - Variety
  - Moderation
- Undernutrition: state of inadequate nutrition
- Overnutrition: excess nutrients and/or calories in diet
- Malnourished: long-term outcome of consuming a diet that does not meet nutrient needs
  - Can result from both under- and overnutrition
- Tools to help avoid under- and overnutrition:
  - Dietary reference intakes (DRI)
    - Nutrient recommendations

What is Healthy Eating and What Tools Can Help?

  - Dietary guidelines for Americans
    - General dietary and lifestyle advice
  - MyPlate
    - Food recommendations based on DRIs
  - Daily values on food labels

What Are the Dietary Reference Intakes?

- DRIs tell you how much of each nutrient you need to consume to:
  - Maintain good health
  - Prevent chronic diseases
  - Avoid unhealthy excesses
- Issued by U.S. National Academy of Sciences' Institute of Medicine
- Updated periodically based on latest scientific research

DRIs Encompass Several Reference Values

- Estimated average requirement (EAR)
  - Average amount of a nutrient known to meet the needs of 50% of individuals of same age and gender
  - Starting point for determining the other values
- Recommended dietary allowance (RDA)
  - Based on the EAR, but set higher
  - Average amount of a nutrient that meets the needs of nearly all individuals (97% to 98%)
- Adequate intake (AI)
  - Used if scientific data to determine EAR and RDA are insufficient
  - Next best estimate of amount of nutrient needed to maintain good health
- Tolerable upper intake level (UL)
  - Highest amount of nutrient that is unlikely to cause harm if consumed daily
  - Consuming amount higher than the UL daily may cause toxicity

DRIs Encompass Several Reference Values

- Estimated energy requirement (EER)
  - Amount of daily energy needed to maintain healthy body weight and meet energy needs
  - Different approach than RDAs or AIs
  - Takes into account age, gender, height, weight, and activity level

Table 2.1

How Many Calories Do You Need Daily?

The amount of calories you need daily is based upon your age, gender, and activity level.*

Males				Females			
Age	Sedentary	Moderately Active	Active	Age	Sedentary	Moderately Active	Active
16–18	2,400	2,800	3,200	16–18	1,800	2,000	2,400
19–20	2,600	2,800	3,000	19–20	2,000	2,200	2,400
21–25	2,400	2,800	3,000	21–25	2,000	2,200	2,400
26–30	2,400	2,600	3,000	26–30	1,800	2,000	2,400
31–35	2,400	2,600	3,000	31–35	1,800	2,000	2,200
36–40	2,400	2,600	2,800	36–40	1,800	2,000	2,200
41–45	2,200	2,600	2,800	41–45	1,800	2,000	2,200
46–50	2,200	2,400	2,800	46–50	1,800	2,000	2,200

Source: U.S. Department of Agriculture, *Dietary Guidelines for Americans, 2010*. Available at www.health.gov.

*Note: These calorie levels are based on the Institute of Medicine's Estimated Energy Requirements from the *Dietary Reference Intakes: Macronutrients Report*, 2002.

Sedentary: Partaking in less than 30 minutes a day of moderate physical activity in addition to daily activities.

Moderately Active: Partaking in at least 30 minutes and up to 60 minutes a day of moderate physical activity in addition to daily activities.

Active: Partaking in 60 or more minutes a day of moderate physical activity in addition to daily activities.

Table 2 1

Dietary Guidelines for Americans at a Glance

- Two overarching concepts:
  - Maintain calorie balance over time to achieve and sustain healthy weight
  - Consume more nutrient-rich foods and beverages
- Key recommendations:
  - Balance calories to manage weight
    - Improved eating habits, increased physical activity
  - Reduce some food components
    - Limit sodium, saturated fat, dietary cholesterol, trans fat, sugars, refined grains, and alcohol
  - Increase some foods and nutrients
    - More fruits and vegetables, whole grains, fat-free dairy, lean meats, seafood, oils instead of solid fats
    - Choose foods with potassium, dietary fiber, calcium, and vitamin D

Dietary Guidelines for Americans at a Glance

  - Build healthy eating patterns
    - Select eating pattern that meets nutrient needs over time
    - Follow food safety recommendations when preparing and eating foods to avoid foodborne illness

What Are MyPlate and ChooseMyPlate.gov?

- MyPlate is the most recent food guidance system for Americans, released by the USDA in 2010
  - Food guidance systems: visual diagrams providing variety of food recommendations to help create a well-balanced diet
  - Part of web-based initiative, ChooseMyPlate.gov
  - Shows variety of food groups
  - Promotes proportionality, moderation, variety, and personalization of diet

Figure 2 4

How to Use MyPlate and ChooseMyPlate.gov

- ChooseMyPlate.gov gives you the number of servings to eat from each food group based on daily calorie needs
  - Calorie needs are based on age, gender, and activity level

Does the Time of Day You Eat Impact Your Health?

- Eating breakfast means more energy and fewer calories throughout the day
- Eating more during evenings and weekends can lead to overconsumption of calories
- Recommendations:
  - Start your day with nutrient-rich breakfast
  - Choose breakfast foods that are satisfying and improve appetite control throughout the day
  - Control calorie intake on nights and weekends

What is a Food Label and Why is it Important?

- The food label tells you what's in the package
  - To help consumers make informed food choices
- The U.S. Food and Drug Administration (FDA) mandates that every packaged food be labeled with:
  - Name of the food
  - Net weight
  - Name and address of manufacturer or distributor
  - List of ingredients in descending order by weight
  - Nutrition information
  - Uniform serving sizes
  - How a serving of food fits into an overall daily diet
  - Uniform definitions for descriptive labels terms such as "fat-free" and "light"
  - Health claims that are accurate and science-based
  - Presence of any of eight common allergens

What is a Food Label and Why is it Important?

- Foods exempt from nutrition labeling:
  - Plain coffee/tea, spices, deli items, bakery foods, ready-to-eat foods prepared and sold in restaurants or produced by small businesses
- The food label can help you make healthy food choices
- Nutrition facts panel: area on food label that provides uniform listing of specific nutrients obtained in one serving
  - Calories and calories from fat
  - Total fat, saturated fat, and trans fat
  - Cholesterol
  - Total carbohydrate, dietary fiber, and sugars
  - Protein
  - Vitamin A, vitamin C, calcium, and iron

What is a Food Label and Why is it Important?

- Three types of label claims
  1. Nutrient content claims: describe the level or amount of a nutrient in food product
  2. Health claims: describe a relationship between a food or dietary compound and a disease or health-related condition
  3. Structure/function claims: describe how a nutrient or dietary compound affects the structure or function of the human body

What's the Real Deal When it Comes to Nutrition Research and Advice?

- Newspaper headlines and television news items that report results of a single research study can be misleading
- In contrast, advice from authoritative health and nutrition organizations is based on:
  - Consensus: the opinion of group of experts based on collection of information

You Can Obtain Accurate Nutrition Information on the Internet

- National Institutes of Health (NIH) 10 questions to consider when viewing a health-related website:
  1. Who runs the site?
  2. Who pays for the site?
  3. What is the purpose of the site?
  4. Where does the information come from?
  5. What is the basis of the information?
  6. How is the information selected?
  7. How current is the information?
  8. How does the site choose links to other sites?
  9. What information does the site collect about you and why?
  10. How does the site manage interactions with visitors?

Nutrition in the Real World: Quackwatchers

- Beware of health quackery and fraud
  - Promotion and selling of health products and services of questionable validity
  - Salespeople introduce health fears and make false nutrition claims and unrealistic promises and guarantees
  - The FDA's health fraud website helps consumers identify quackery and fraud

You Can Trust the Advice of Nutrition Experts

- Registered dietitian (RD): completed at least a bachelor's degree at an accredited U.S. college or university and a supervised practice, and passed a national exam administered by the American Dietetic Association
- Public health nutritionist: has a degree in nutrition but is not an RD (if did not complete supervised practice, not eligible to take American Dietetic Association exam)
- Professionals holding advanced degrees in nutrition

Nutrition

Presented by
Allison B. Kerin MS, RD, LD

Thank you for watching!

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