Chapter 6 – Protein KEY

Read Chapter 6 Page 191-233

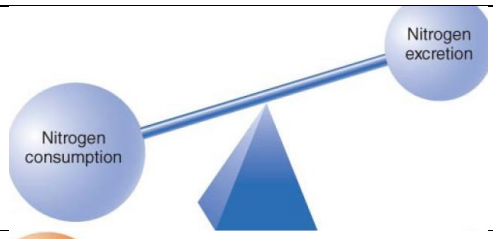
Define the following terms:

1. **Protein:** Large molecules made of amino acids essential components of living cells
2. **Amino Acids:** Nitrogen containing molecules that combine to form proteins (building blocks of protein)
3. **Gene:** A segment of DNA that serves as a template for the synthesis of a protein.
4. **Vegetarianism:** Practice of restricting the diet to foods of plant origin.

Answer the following questions:

1. **How many amino acids are there?** 20
2. **What is an essential amino acid? How many are there?** Amino acids that are NOT produced by the body and must be obtained by food. There are 9.
3. **What is a non-essential amino acid?** Amino acids that ARE manufactured by the body.
4. **What does gene expression refer to?** The process of using a gene to make a protein.
5. **Look over the figure on slide 7.**
   a. **What are the body's two sources of amino acids for our amino acid pool?** I. Food. II. Break down of our cells
   b. **List five reasons why we need an amino acid pool.**
      - Synthesis of non-protein compounds that contain nitrogen
      - Synthesis of body proteins
      - Synthesis of fat from amino acids
      - Synthesis of glucose from amino acids
      - Energy produced from amino acids
   c. **What happens to excess amino acids from the amino acid pool?** It gets synthesized into urea, which is later excreted in the urine.
6. **What is an incomplete protein?** Foods that DO NOT contain all 9 essential amino acids.
7. **What is a complete protein?** Foods that DO contain all 9 essential amino acids.
8. **List seven complete proteins:** Egg whites, meat, poultry, fish, milk, soybeans, quinoa
9. **Explain the concept of complementary proteins.** Two or more foods that together contain all 9 essential amino acids.
10. **List 7 reasons why your body needs protein.**
    - Cell growth, repair, and maintenance
    - Enzymes and hormones
    - Maintain fluid and electrolyte balance
    - Maintain acid-base balance
    - Maintain strong immune system
    - Energy source
    - Assist in transport and storage of nutrients
11. **Antibodies are proteins. What do they do for us?** Defensive proteins of the immune system.

12. **Look the figure on slide 13. Fill in the chart below.**

Energy Balance	Sketch the "Balance"	Summary
Positive		Needed for growth, pregnancy, recovery from illness
Negative		Results from starvation, consumption of very low energy diets, severe illness, infection, burns, injuries
Balanced		Found in healthy adults

13. **List two ways too much dietary protein can be harmful.** High blood cholesterol & Kidney disease
14. **Look over Table 6.2 on page 209. Complete the chart. [Recommended Protein Intakes]**

Group of People	Protein intake (grams/kg of body weight)
Sedentary Adults	0.8
Non-vegetarian Endurance Athlete	1.2-1.4
Non-vegetarian Strength Athlete	1.2-1.7
Vegetarian Endurance Athlete	1.3-1.5
Vegetarian Strength Athlete	1.3-1.8

15. **Based on the above chart, highlight which group of people need the most dietary protein?**
    Sedentary people --- non-vegetarian endurance athletes --- non-vegetarian strength athletes --- vegetarian endurance athlete --- vegetarian strength athletes
16. **List eight legume sources of protein:** Soybeans, kidney beans, pinto beans, black beans, chickpeas, lentils, green peas, black-eyed peas
17. **According to research what two diseases can consuming 2-5 ounces of nuts/week reduce the chances of?**
    Cardiovascular disease & Type 2 diabetes
18. **Suggest six possible benefits of vegetarianism.**
    - Reduced risk of obesity
    - Lower blood pressure
    - Reduced risk of heart disease
    - Reduced risk of digestive problems
    - Reduced risk of cancers
    - Reduced risk of kidney disease
19. **What is protein-energy malnutrition?** A disorder caused by inadequate consumption of protein. There are two main diseases (Marasmus & Kwashiorkor). The first is deadly. The second is essentially a lesser form of the first. It can be reversed but often it leads to stunted growth, massive bloating, and often death.

20. **Read/Discuss on Page 208: Do Athletes Need More Protein?** Most North Americans eat much more protein than what they need (or is recommended). A balanced diet is usually sufficient (or better yet, ***ideal***) than taking protein supplements.