

# Nutrients: Carbohydrates, Proteins, and Fats

Chapter 5 Lesson 2

# Carbohydrates

- ◆ Definition- *the starches and sugars found in foods.*
- ◆ Carbohydrates are the body's preferred source of energy providing four calories per gram.
- ◆ Depending on their chemical makeup carbohydrates are classified as either simple or complex.
- ◆ Health experts recommend that 55-65% of your daily calories come from carbohydrates, mainly complex carbohydrates.

# Simple Carbohydrates

- ◆ Simple carbohydrates, or sugars are present naturally in fruit, milk, and some vegetables
- ◆ These sugars are called fructose in fruit, lactose in milk, maltose in grain, and sucrose in table sugar.
- ◆ Sugars are also added to many manufactured products including, cookies, candy, soft drinks, salad dressings, soups, and certain types of bread.

# Complex Carbohydrates

- ◆ Complex carbohydrates, or starches, are found in great supply in rice and other grains, seeds, nuts, legumes (dried peas and beans), and tubers (potatoes, yams).
- ◆ Starches are called complex carbohydrates because they are chemically more complex than simple carbohydrates.
- ◆ During digestion, starches break down into sugars

# The Role of Carbohydrates

- ◆ Before your body uses carbohydrates, it must first convert them to **glucose**- *a simple sugar and the body's chief fuel.*
- ◆ Glucose that is not used right away is stored in the liver and muscles as **glycogen**- *a starch like substance.*
- ◆ When people consume more carbohydrates than their body needs for energy or can store as glycogen, this excess is stored as body fat.

# Fiber

- ◆ Found in the tough, stringy part of vegetables, fruits, and grains, fiber is a special kind of complex carbohydrate.
- ◆ Although it cannot be digested and used as energy, fiber serves many vital functions in the body such as moving waste through the digestive system.
- ◆ Studies have shown that fiber helps prevent constipation, appendicitis, lower blood cholesterol, as well as reduce the risk of certain types of cancers.
- ◆ For people watching their weight, fiber offers other health benefits. Fiber foods are bulky, so they offer a feeling of fullness.
- ◆ You can increase your fiber intake by consuming more fruits, vegetables, whole grain breads, brown rice, and oatmeal.
- ◆ Experts recommend you consume at least 25 grams of fiber a day.

# Proteins

- ◆ Definition- *nutrients that help build and maintain body tissues.*
- ◆ Muscle, bone, and connective tissue, as well as teeth, skin, blood, and vital organs all contain protein.
- ◆ Like carbohydrates, protein contains 4 calories per gram with any excess unused calories being stored as body fat.
- ◆ Just as letters of the alphabet are arranged to make different words, proteins are made of chains of building blocks called amino acids.
- ◆ Amino acids are *substances that make up the body's proteins.* Your body can make up all but 9 of the 20 different amino acids. These 9 are called essential amino acids because they must come from the foods you eat.

# Complete and Incomplete Proteins

- ◆ Complete proteins- are foods that contain all essential amino acids that the body needs in proper amounts. These sources include animal products such as, fish, meat, poultry, eggs, milk, cheese, yogurt, and many soybean products.
- ◆ Incomplete Proteins- foods that lack some of the essential amino acids. Such sources are foods derived from the seeds of plants, legumes, nuts, whole grains, and the seeds themselves. Eating various incomplete proteins yields the equivalent of a complete protein.



# The Role of Proteins

- ◆ During each of the normal period of marked growth- infancy, childhood, adolescent, and pregnancy- amino acids build new body tissues. Throughout life, new proteins form constantly to replace damaged or worn out body cells
- ◆ Proteins in enzymes, hormones, and antibodies also help regulate many body processes. Enzymes are substances that help control the rate of thousands of biomechanical reactions in your body's cells. Hormones regulate reactions. Antibodies help identify and destroy bacteria and viruses that cause disease in the body.

# Fats

- ◆ Although you've heard that consuming too much fat is unhealthy, the fact is your body needs some fat.
- ◆ Fat represents the most concentrated form of energy available. Fat delivers 9 calories per gram- more than twice that of carbohydrates and proteins.
- ◆ Chemically fats are a type of lipid- *a fatty substance that does not dissolve in water.*
- ◆ Fats are either classified as saturated or unsaturated depending on their chemical composition.

# Saturated Fats

- ◆ Foods high in saturated fat are usually solid at room temperature such as that of: animal fat, pork, egg yolks, and dairy foods.
- ◆ A fatty acid is said to be saturated when it holds all of the hydrogen atoms it can.
- ◆ A high intake of saturated fats is associated with an increased risk of heart disease.

# Unsaturated Fats

- ◆ A fatty acid is described as unsaturated when it is missing one or more pairs of hydrogen atoms.
- ◆ Unsaturated fats become liquid, or oils at room temperature.
- ◆ Most vegetable fats, including olive, canola, soybean, corn, and cotton seed oils are unsaturated.

# The Role of Fats

- ◆ Fats carry vitamins A,D,E,and K into your bloodstream and are a good source of linoleic acid- *an essential fatty acid not made by the body but which is essential for growth and healthy skin.*
- ◆ Fats in food add flavor and help to satisfy hunger since they take longer to digest than carbohydrates or proteins.
- ◆ Body fat plays a different role than dietary fat. You need body fat to surround and cushion your vital organs. Body fat also helps to insulate your body from the cold.
- ◆ No more than 30% of your daily caloric intake should come from fat. More than 30% puts you at a high risk for developing obesity and many health problems that are linked to obesity.

# Cholesterol

- ◆ Definition- *a fatlike substance produced in the liver of all animals and therefore found only in foods of animal origin.*
- ◆ Your body needs some cholesterol, but it can make what it needs.
- ◆ Cholesterol is instrumental in the production of sex hormones, vitamin D, and the protective sheath around nerve fibers as well as cell walls.
- ◆ Elevated levels of cholesterol in the blood constitute a major risk factor for heart and other circulatory diseases.
- ◆ Consumption of dietary fat, especially saturated fat tends to raise cholesterol levels.