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**DEPARTMENT OF ANIMAL NUTRITION**

**NUTRITIONAL ASPECT OF  
CARBOHYDRATE, FAT AND PROTEIN  
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# *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.*

# *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.*

# *The Role of Proteins*

- ◆ *During each of the normal period of marked growth- infancy, childhood, adolescence, 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.*



# *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 bodyfat 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.*