

LESSON 1: ORGANIZATION OF THE CLASS, LABORATORY PREPARATION, AND EQUIVALENTS AND MEASUREMENTS

- **Laboratory Preparation** - is the process of getting ready before performing laboratory activities.
- **Laboratory demonstrations** - are done by the instructor to show the correct use of equipment and proper techniques before students perform the activity.
- **Board work** - refers to organizing important information on the board so students can easily follow instructions.
- **Laboratory instruction** - means the instructor actively guides students throughout the laboratory session.
- **Laboratory roles** - refer to the responsibilities of both the instructor and students. The instructor guides learning, while students are expected to think critically, participate actively, and become responsible for their own learning.
- **Laboratory Procedures** - are the rules and step-by-step methods followed to ensure safety, accuracy, and efficiency during laboratory work. Always follow instructions, use equipment properly, and observe safety measures.
- **Food Preparation** - is the process of preparing food using correct methods and techniques. Basic techniques include measuring dry ingredients, measuring powdered ingredients, measuring liquids, peeling fruits and vegetables, slicing, dicing, chopping, mincing, and cutting food into julienne strips. Correct food preparation ensures accurate recipes and quality results.
- **Purchasing** - is the organized process of buying goods and services needed for food preparation or laboratory activities. Proper purchasing helps control costs and ensures good-quality ingredients and materials are obtained.
- **Cooking Equivalents and Measurements** - are standard units used to measure ingredients accurately. Accurate measurements are important because they affect the taste, texture, and quality of food.

Measurement Equivalents:

- 1 teaspoon (tsp) = **5 mL**
- 1 tablespoon (tbsp) = **15 mL**
- 2 tablespoons = **30 mL = 1 fluid ounce**

- 1 cup = **237 mL = 8 fluid ounces**
- 2 cups = **1 pint**
- 4 cups = **1 quart**
- 4 quarts = **1 gallon**
- 1 liter (L) = **1000 milliliters (mL)**
- 16 ounces (oz) = **1 pound = 454 grams (g)**

- **Volume** - is the amount of space occupied by a liquid and is measured using units such as milliliters (mL), liters (L), teaspoons, tablespoons, and cups.
- **Mass (Weight)** - is the amount of matter in an object and is measured in grams (g), kilograms (kg), ounces (oz), and pounds (lb).
- **Metric System** - is the standard system of measurement used by most countries. It includes units such as grams, liters, and meters. Some countries like the United States also use customary units, so knowing how to convert between systems is important.
- Grams measure **mass**, while teaspoons and tablespoons measure **volume**. They cannot always be converted directly because different substances have different densities. Water is the exception, where **1 gram is approximately equal to 1 milliliter**.

LESSON 2: NUTRITION CARE PLAN MAKING

- The **Nutrition Care Process (NCP)** is a **systematic and standardized approach** used by Registered Dietitian Nutritionists (RDNs) to provide high-quality nutrition care. It follows **four connected steps**:
 - **Assessment**
 - **Diagnosis**
 - **Intervention**
 - **Monitoring & Evaluation**
- The process is **continuous** because new patient information may require changes in the care plan.

Step 1: NUTRITION ASSESSMENT

Nutrition Assessment - is the process of collecting and analyzing information to identify nutrition-related problems and their causes. It is the foundation of the Nutrition Care Process.

The five domains of nutrition assessment are:

- **Food/Nutrition-Related History** - Information about food intake, eating habits,

medications, supplements, physical activity, food availability, and nutrition knowledge.

- **Anthropometric Measurements** – Body measurements such as height, weight, Body Mass Index (BMI), growth pattern, and weight history.
- **Biochemical Data** – Laboratory results and medical tests such as blood glucose, electrolytes, cholesterol, and metabolic tests.
- **Nutrition-Focused Physical Findings** – Physical signs of nutrition status, including muscle wasting, fat loss, swallowing ability, appetite, and overall appearance.
- **Client History** – Personal, medical, family, and social history, including previous treatments and illnesses.

BMI (Body Mass Index) is a measurement used to determine if a person's weight is appropriate for their height.

The main purpose of assessment is to gather accurate data before making a nutrition diagnosis.

Step 2: NUTRITION DIAGNOSIS

Nutrition Diagnosis - is the identification of a nutrition problem that the nutrition professional can treat. It is different from a **medical diagnosis**, which identifies a disease.

Nutrition diagnosis is written using the **PES Statement**.

- **P (Problem)** – The nutrition problem identified.
- **E (Etiology)** – The cause or contributing factor of the problem. It is connected using the words "related to."
- **S (Signs and Symptoms)** – Evidence that proves the problem exists. It is connected using the words "as evidenced by."

Example: **Inadequate energy intake related to poor appetite as evidenced by 5 kg weight loss.**

A good nutrition diagnosis focuses on problems that can be improved through nutrition care.

Step 3: NUTRITION INTERVENTION

Nutrition Intervention - is the planned action taken to correct or improve the identified nutrition problem.

The five types of nutrition intervention are:

- **Food and Nutrient Delivery** – Providing or modifying food and nutrient intake.
- **Nutrition Education** – Teaching patients about healthy eating and nutrition skills.
- **Nutrition Counseling** – Helping patients change eating behaviors through guidance and goal-setting.
- **Coordination of Nutrition Care** – Working with other healthcare professionals for better patient care.
- **Population-Based Nutrition Action** – Nutrition programs designed to improve the health of groups or communities.

Planning an intervention includes setting goals, creating a nutrition prescription, selecting appropriate strategies, and scheduling follow-up care. Implementation involves carrying out and adjusting the plan when needed.

Step 4: NUTRITION MONITORING AND EVALUATION

Nutrition Monitoring and Evaluation - is the process of checking whether the nutrition intervention is working and whether the patient's goals have been achieved.

Healthcare providers monitor changes in:

Food intake and eating habits, body measurements (weight and BMI), laboratory values, and physical signs of nutrition status.

The information collected is compared with previous findings to determine if the patient's condition has improved or if the care plan needs to be changed.

LESSON 3: CALCULATING DIET PLANS & MEAL PLANS

- **Meal planning** - is the process of choosing foods that provide the right amount of nutrients and calories based on a person's needs. It helps maintain health, prevent disease, and meet nutritional goals. Before planning therapeutic diets, nurses must first

know how to calculate calorie needs and prepare balanced meals for healthy individuals.

- **Food Exchange List** - is a meal-planning tool that groups foods with similar amounts of carbohydrates, protein, fat, and calories. Foods within the same group can be exchanged without greatly changing the nutrient content of the meal. The six food groups are:
 - Starch/bread
 - Meat
 - Fruits
 - Vegetables
 - Fats
 - Milk
- **CARBOHYDRATES** - are organic compounds made of carbon, hydrogen, and oxygen. They are the body's main source of energy and may be simple or complex.
 - **Monosaccharides** - are the simplest form of carbohydrates made of one sugar unit, such as glucose.
 - **Disaccharides** - are carbohydrates made of two sugar units, such as sucrose and lactose.
 - **Polysaccharides** - are complex carbohydrates made of many sugar units, such as starch and fiber.

Common carbohydrate sources include grains (rice, bread, cereals, pasta), starchy vegetables (potatoes, carrots, peas), legumes (beans, chickpeas), and fruits (bananas, apples, grapes, pears).

- **PROTEINS** - are nutrients made of amino acids and contain carbon, hydrogen, oxygen, and nitrogen. They are essential for growth, tissue repair, enzyme production, and body maintenance.
 - **Amino acids** are the building blocks of proteins.
 - **Essential amino acids** cannot be produced by the body and must come from food. The nine essential amino acids are Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, and Valine. Mnemonic: **HILLIMPTTV**.
 - **Nonessential amino acids** are amino acids that the body can produce on its own.

- **FATS (LIPIDS)** - are nutrients that store energy, protect organs, and help absorb fat-soluble vitamins.

The three classifications of lipids are:

- **Triglycerides** - main form of body fat and dietary fat
- **Phospholipids** - an important part of cell membranes
- **Sterols** - such as cholesterol.

Lipids improve the texture and flavor of foods and help maintain normal body functions.

Calorie - is the unit used to measure energy from food. It tells how much energy the body receives when food is eaten. Calories measure energy, not weight or size.

HEALTHY EATING PLAN

- A **healthy eating plan** provides all the nutrients the body needs while staying within daily calorie requirements. It helps reduce the risk of heart disease and other illnesses.
- A healthy eating plan emphasizes vegetables, fruits, whole grains, and low-fat or fat-free dairy products. It includes lean meats, fish, poultry, beans, eggs, and nuts while limiting saturated fat, trans fat, sodium, and added sugars. Portion control is also important.
- **MyPyramid** - is a nutrition guide that promotes eating a variety of nutrient-rich foods every day while staying within individual calorie needs. It encourages balance, variety, and moderation.

LESSON 4: MACRONUTRIENTS: CARBOHYDRATES PART 1

- Carbohydrates are **macronutrients**, meaning nutrients the body needs in large amounts to provide energy. They supply **4 calories per gram** and should make up about **50-60% of the total daily calorie intake**. Their main role is to provide the body's quickest and preferred source of energy.
- **Glucose** - is the simple sugar produced when carbohydrates are digested. It is the main fuel used by the brain, muscles, and other body cells. The body converts almost

Extra food
or energy than
has been stored in liver
and muscle

all carbohydrates into glucose for immediate energy.

- **Glycogen** - is the stored form of glucose found in the liver and muscles. When blood glucose decreases, glycogen is broken down to provide energy. If glycogen stores are already full, excess carbohydrates are converted into body fat.
- Carbohydrates are divided into **healthy (complex)** and **not-so-healthy (simple)** carbohydrates.
- **Complex carbohydrates** - are digested slowly, provide long-lasting energy, help control blood sugar, and keep you full longer. Examples include brown rice, whole grains, multigrain bread, beans, and lentils.
- **Simple carbohydrates** - are digested quickly, causing a rapid rise in blood sugar followed by a quick drop. Examples include candy, cakes, cookies, soft drinks, sweetened beverages, and sugary juices.

Steady

Rapid

Foods naturally rich in carbohydrates include

- rice
- bread
- corn
- potatoes
- sweet potatoes
- bananas
- dried fruits
- beans
- These foods are important energy sources and should not be completely avoided. Weight management is better achieved by reducing added sugars while choosing more complex carbohydrates.
- Carbohydrates are the body's **primary fuel source**, especially for the brain and muscles. Although fats and proteins can also provide energy, carbohydrates are the body's preferred and fastest source. Experts recommend that **45-65% of daily calories** come from carbohydrates, depending on individual needs.
- **Fiber** - is a type of carbohydrate that cannot be digested by the body. It adds bulk to the stool, supports digestion, helps control blood sugar, lowers cholesterol, and increases fullness after meals.
 - **Sucrose** is a **disaccharide** made of **glucose + fructose**.
 - **Lactose** - **glucose + galactose** found in milk
 - **Maltose** - **glucose + glucose** found in germinating grains.

- Too much **added sugar** increases the risk of tooth decay, overweight or obesity, diabetes, and heart disease. Common added sugars listed on food labels include **raw sugar, corn syrup, and molasses**, so reading ingredient labels is important.

LESSON 5: MACRONUTRIENTS: PROTEINS

- **Proteins** are **macronutrients**, meaning nutrients the body needs in large amounts. They are essential for:
 - **Growth**
 - **Repair of body tissue**
 - **Maintenance of muscles**
 - **Production of enzymes and hormones**
 - **Proper body function**
- Protein can also be used as an energy source when carbohydrates and fats are not enough. The amount of protein a person needs depends on their **age, sex, body weight, and health status**.
- **Amino acids** - are the **building blocks of proteins**. There are **20 amino acids** that combine in different ways to form proteins. The body can produce **11 non-essential amino acids**, while **9 essential amino acids** cannot be made by the body and must come from food. A protein's **nutritional value** depends on the amount and quality of essential amino acids it contains.
 - **Complete protein** - (also called **high-quality protein**) contains all nine essential amino acids. These are commonly found in **animal foods** such as **meat, fish, poultry, eggs, and dairy products**. **Soy, quinoa, and amaranth** are also complete protein sources.
 - **Incomplete protein** - lacks one or more essential amino acids and is usually found in **plant foods** such as **beans, lentils, nuts, seeds, and whole grains**. Vegetarians and vegans can still meet their protein needs by eating a variety of plant protein sources throughout the day.
- Good sources of protein include **lean meat, poultry, fish, seafood, eggs, milk, yogurt, cheese, nuts, seeds, legumes, beans, lentils, chickpeas, and tofu**. Grain and cereal products also contain protein but generally in smaller amounts. The two major food groups that provide protein are **lean meat and meat alternatives** and **milk and dairy products or their alternatives**.

Proteins also have different **functions** in the body:

- **Transport proteins** - carry substances throughout the body, such as **hemoglobin**, which transports oxygen in the blood.
- **Structural proteins** - provide support and strength, such as **collagen** in tendons and cartilage and **keratin** in hair, skin, and nails.
- **Enzymes** - are proteins that speed up chemical reactions, such as **amylase**, which helps digest starch.
- **Storage proteins** - store nutrients for future use.

PROTEIN DEFICIENCY - occurs when the body does not get enough protein. Common signs include:

- **Weight loss**
- **Muscle weakness**
- **Muscle fatigue**
- **Hair loss**
- **Slow wound healing**
- **Poor growth in children.**

Severe protein deficiency may lead to diseases such as:

- **Kwashiorkor** - caused by inadequate protein intake despite adequate calories.
- **Marasmus** - caused by severe deficiency of both protein and calories. Treatment involves increasing protein intake through a balanced diet based on the individual's nutritional needs.

LESSON 6: MACRONUTRIENTS: FATS PART 1

DIETARY FATS

- **Dietary fats** are **macronutrients**, meaning nutrients the body needs in large amounts. Like carbohydrates and proteins, fats provide energy, but they also have many other important functions.
- Fats help the body produce energy, absorb **fat-soluble vitamins (A, D, E, and K)**, protect organs, insulate the body to keep it warm, and support the health of the heart and brain. Eating fat does not automatically cause weight gain because the effects depend on the **type of fat** consumed.

GOOD FATS VS. BAD FATS

- **Good fats** - are healthy fats that improve overall health. They include **unsaturated fats**, which are divided into **monounsaturated fats** and **polyunsaturated fats**.
- **Monounsaturated fats (MUFAs)** - are fats with one double bond in their chemical structure. They help lower **LDL (bad cholesterol)** while maintaining or increasing **HDL (good cholesterol)**. Common sources include:
 - olive oil
 - avocado
 - peanuts
 - almonds
 - cashews
- **Polyunsaturated fats (PUFAs)** - are fats with two or more double bonds. They include **omega-3** and **omega-6 fatty acids**, which are essential because the body cannot produce them. They support heart health, brain function, reduce inflammation, and may lower LDL cholesterol. Sources include salmon, tuna, sardines, walnuts, flaxseeds, sunflower oil, and soybean oil.
- **Bad fats** include **saturated fats** and **trans fats**.
- **Saturated fats** - are fats that are usually **solid at room temperature**. Eating too much can raise LDL cholesterol and increase the risk of heart disease. Common sources include:
 - fatty meats
 - butter
 - cheese
 - cream
 - coconut oil
 - palm oil.
- **Trans fats** - are artificially produced fats that increase LDL cholesterol and decrease HDL cholesterol. They are the **least** healthy type of fat and are commonly found in:
 - fried foods
 - baked goods
 - margarine
 - processed snacks.

CHOLESTEROL

- **Cholesterol** - is a waxy, fat-like substance that the body needs to make hormones, vitamin D, and cell membranes. Cholesterol itself is not harmful, but having too much of the wrong type can increase the risk of heart disease.
 - **HDL (High-Density Lipoprotein)** - is called **good cholesterol** because

it removes excess cholesterol from the blood and carries it to the liver for disposal, helping protect the heart.

- **LDL (Low-Density Lipoprotein)** - is called **bad cholesterol** because high levels can build up in the arteries, causing **plaque**, which **narrows blood vessels** and **increases the risk of heart attack and stroke**.
- The **type of fat eaten** has a greater effect on cholesterol levels than the amount of cholesterol in food. Replacing saturated and trans fats with unsaturated fats helps maintain healthy cholesterol levels.

LESSON 7: MACRONUTRIENTS: FATS PART 2

- **Fats (Lipids)** are **macronutrients** that provide **9 calories per gram**, making them the body's most concentrated source of energy. They help absorb the fat-soluble vitamins (**A, D, E, and K**), build **cell membranes** (the protective outer layer of cells), produce hormones, insulate the body to keep it warm, protect organs from injury, and maintain **homeostasis**, which is the body's ability to keep its internal environment stable.
- **Saturated fats** - are fats that are usually **solid at room temperature**. They are found in foods such as butter, coconut oil, meat, and dairy products. While they can be part of a healthy diet when eaten in moderation, processed meats like bacon, hotdogs, sausages, and luncheon meats should be limited because they are associated with higher health risks.
- **Monounsaturated fats (MUFAs)** - are considered **heart-healthy fats**. They help improve heart health, support insulin sensitivity, promote healthy energy levels, and may help with weight management. Good sources include avocado, olive oil, olives, and macadamia nuts. Olive oil is one of the healthiest cooking oils because it contains beneficial fats and antioxidants.
 - **Antioxidants** - are substances that protect body cells from damage caused by harmful molecules called free radicals.
- **Polyunsaturated fats (PUFAs)** - are fats that include **Omega-3** and **Omega-6 fatty acids**.
- **Omega-3 fatty acids** - are essential fats that reduce inflammation, support brain and heart health, help maintain healthy

hormone levels, and strengthen cell membranes. Excellent sources include salmon, sardines, flaxseed, and krill oil.

- **EPA (Eicosapentaenoic Acid)** - is an omega-3 fatty acid that mainly supports heart health and reduces inflammation.
- **DHA (Docosahexaenoic Acid)** - is another omega-3 fatty acid that is essential for normal brain and eye development and function.
- **Omega-6 fatty acids** - are also essential because they **support brain and muscle function**. However, consuming too much may promote inflammation. Omega-6 fats are commonly found in processed foods, baked goods, chips, fries, and vegetable oils such as corn, soybean, safflower, sunflower, cottonseed, and grapeseed oils. A healthy diet should include more omega-3 fats and moderate amounts of omega-6 fats.
- **Trans fats** - are the **least healthy type of fat**. They are produced through:

Hydrogenation - a process that adds hydrogen to liquid vegetable oils to make them solid and last longer. On food labels, they often appear as **partially hydrogenated oils**. Trans fats raise **LDL ("bad") cholesterol**, lower **HDL ("good") cholesterol**, increase the risk of heart disease, and can clog arteries. It is best to avoid foods containing trans fats by checking both the **Nutrition Facts** label and the **ingredient list**.

Healthy fat choices include olive oil, avocado, coconut oil, flaxseed oil (not heated), raw nuts, salmon, sardines, grass-fed dairy products, eggs, and ghee for high-heat cooking. These foods provide beneficial fats that support overall health.