UNIT- 5

SPORTS AND NUTRITION

CONTENTS:

1. Concept of balanced diet &nutrition
2. Macro nutrients & micro nutrients: food sources & function
3. Nutritive components of diet & non- nutritive components of diet
4. Eating for weight control -a healthy weight, the pitfalls of dieting, food intolerance and food myths
5. Importance of diet in sports
6. Pre, during, post competition requirements

LEARNING OBJECTIVES :

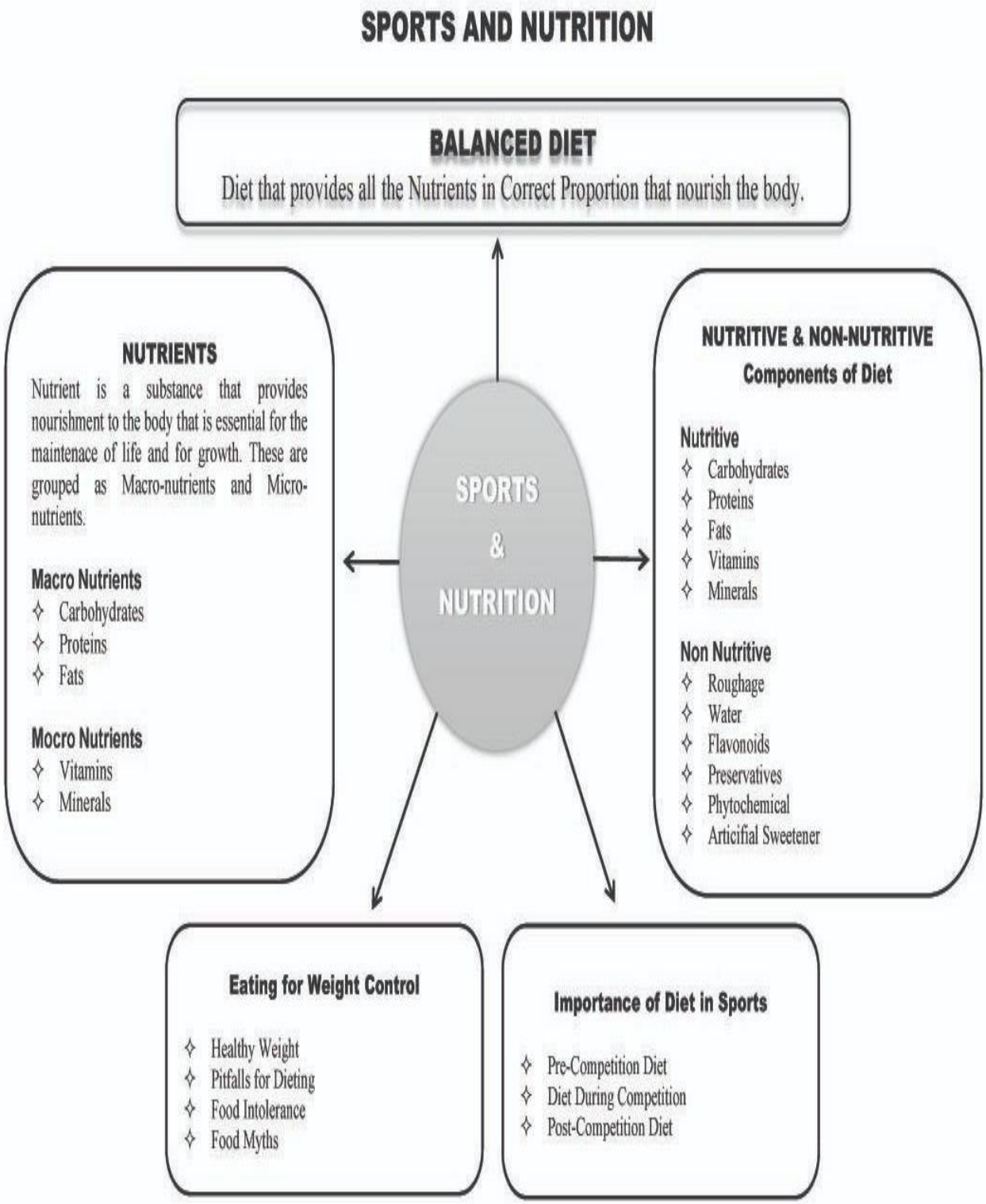
1. Understand the concept and components of a balanced diet for overall health.
2. Explain the role of nutrition in growth, energy production, and disease prevention
3. Differentiate between macronutrients and micronutrients and identify their sources.
4. Analyze the importance of diet and hydration in enhancing sports performance.
5. Recognize the nutritional needs of athletes before, during, and after physical activity..

LEARNING OUTCOMES:

1. Identify the nutritive value of various foods consumed in daily life.
2. Apply knowledge of healthy eating habits to maintain fitness and prevent lifestyle diseases.
3. Understand how food intolerances affect health and how to manage them.
4. Promote the importance of reading food labels and making informed dietary choices.
5. Encourage a healthy relationship with food for both athletic and everyday life purposes.

MIND MAP

MARKS WEIGHTAGE :7 MARKS



5.1 Concept of balanced diet & Nutrition

5.1.1 Balanced Diet

Definition: A balanced diet is a diet that contains different types of foods in the right amounts and proportions to meet the nutritional requirements of the body. It provides adequate energy and all the essential nutrients—carbohydrates, proteins, fats, vitamins, and minerals—for maintaining health, vitality, and well-being.

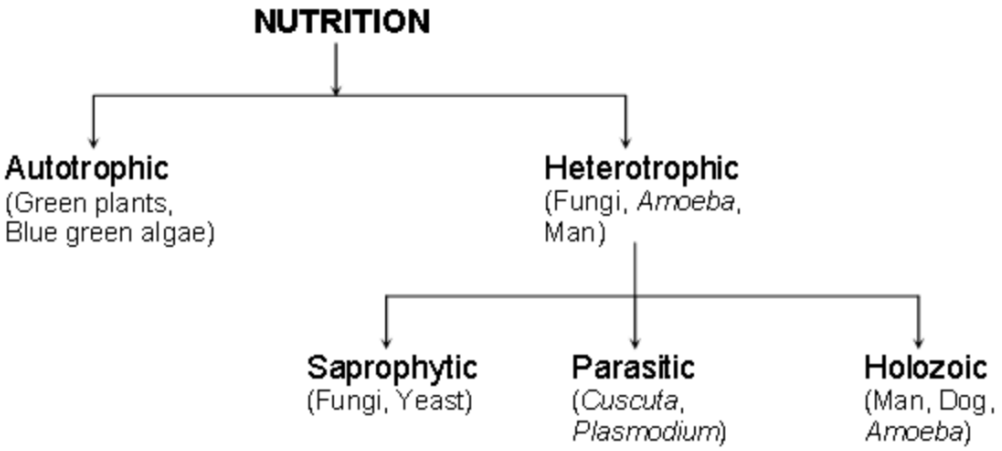
5.1.2 Nutrition

Definition: Nutrition is the scientific study of food and how it affects the body. It involves understanding how the body uses nutrients from food to sustain life and promote growth, development, and overall health

TYPES OF NUTRITION:

Autotrophic Nutrition: Found in plants (e.g., photosynthesis).

Heterotrophic Nutrition: Found in animals and humans (depend on other organisms for fooD).



FUNCTIONS OF NUTRITION IN THE BODY:

- **Energy Production:** Carbohydrates and fats are the main sources.
- **Growth and Development:** Proteins support muscle and tissue growth.
- **Regulation of Body Processes:** Vitamins and minerals support physiological processes like metabolism, nerve function, and immunity.
- **Maintenance and Repair:** Continuous renewal of cells and tissues.

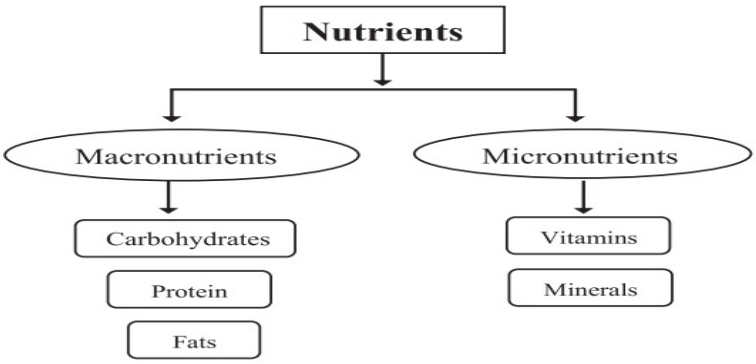
5.2 Nutrients:

Nutrients are substances found in food that your body needs to grow, develop, and stay healthy. They provide energy, help build and repair tissues, and support vital body functions.

Nutrients mainly classified into 2 categories

1.Macro Nutrients

2.Micro Nutrients



1.Macro Nutrients:

Macro nutrients are essential nutrients that your body needs in large quantities to provide energy, maintain bodily functions, and support growth and repair. The term "macro" means large, highlighting the significant amounts of these nutrients required in your diet.

The three main types of macronutrients are:

1. Carbohydrates:

Carbohydrates are the body's primary source of energy. They are broken down into glucose, which fuels your cells, muscles, and especially your brain.

Types:

Simple carbohydrates: Sugars (like those found in fruits, milk, honey, and table sugar) that provide quick energy.

Complex carbohydrates: Starches and fiber (found in whole grains, vegetables, and legumes) that provide a more sustained release of energy due to slower digestion.

Energy content: Approximately 4 calories per gram.

2. Proteins:

Proteins are crucial for building and repairing tissues (muscles, skin, hair, nails, organs), producing enzymes and hormones, and supporting immune function. They are made up of amino acids.

Types:

Complete proteins: Contain all essential amino acids (those your body can't produce) and are typically found in animal products (meat, fish, eggs, dairy).

Incomplete proteins: Lack one or more essential amino acids and are found in most plant-based foods. A combination of different plant proteins can provide all essential amino acids.

Energy content: Approximately 4 calories per gram.

3. Fats (Lipids):

Fats are a concentrated source of energy, provide insulation, protect organs, and are essential for the absorption of fat-soluble vitamins (A, D, E, K). They also play a role in hormone production and cell membrane structure.

Types:

Unsaturated fats: Generally considered "healthy" fats (monounsaturated and polyunsaturated, including omega-3s). Found in avocados, nuts, seeds, and vegetable oils.

Saturated fats: Found primarily in animal products and some plant oils.

Trans fats: Often found in processed foods and should be limited or avoided.

Energy content: Approximately 9 calories per gram (more than double that of carbohydrates and proteins).

2.Micro Nutrients:

Micronutrients are essential nutrients that your body needs in **very small amounts** (hence "micro") to function properly, maintain health, and prevent disease.

Vitamins are essential organic compounds that your body needs in small amounts to function properly. They do not provide energy like carbohydrates or fats, but they help your body use those nutrients efficiently. Each vitamin plays a specific role in maintaining health, such as boosting the immune system, supporting growth and development, and keeping skin, eyes, and nerves healthy.

There are **13 essential vitamins**, and they are divided into two groups:

1. **Fat-soluble vitamins** – Stored in the body's fat and liver.

   Examples: Vitamins A, D, E, and K.

2. **Water-soluble vitamins** – Not stored in the body and must be replenished regularly.

   Examples: Vitamin C and all B-complex vitamins (B1, B2, B3, B6, B12, etc.).

Since the body can't produce most vitamins on its own (except for a few like vitamin D), we must get them through food or supplements. A balanced diet with a variety of fruits, vegetables, grains, and proteins usually provides all the vitamins your body needs.

Fat soluble vitamins:

Vitamin Name (Scientific Name)	Functions & Deficiency Diseases	Sources
Vitamin A (Retinol)	- Helps vision, skin, and immune system - Deficiency: Night blindness, dry skin	Carrots, liver, eggs, leafy greens
Vitamin D (Calciferol)	- Helps absorb calcium for strong bones - Deficiency: Rickets in children, osteomalacia in adults	Sunlight, fish, fortified milk
Vitamin E (Tocopherol)	- Acts as an antioxidant - Deficiency: Nerve and muscle damage	Nuts, seeds, vegetable oils, spinach
Vitamin K (Phylloquinone)	- Helps in blood clotting - Deficiency: Excessive bleeding	Leafy green vegetables, broccoli, liver

Water soluble vitamins:

Vitamin Name (Scientific Name)	Functions & Deficiency Diseases	Sources
Vitamin B1 (Thiamine)	- Helps convert food into energy - Deficiency: Beriberi	Whole grains, pork, nuts, legumes
Vitamin B2 (Riboflavin)	- Supports energy production and skin health - Deficiency: Cracked lips, sore throat	Milk, eggs, leafy greens, almonds
Vitamin B3 (Niacin)	- Supports metabolism and skin health - Deficiency: Pellagra (diarrhoea, dermatitis, dementiA)	Meat, fish, peanuts, whole grains
Vitamin B6 (Pyridoxine)	- Important for brain health and red blood cells - Deficiency: Anaemia, irritability	Bananas, poultry, fish, potatoes
Vitamin B12 (Cobalamin)	- Needed for nerve function and red blood cell formation - Deficiency: Anaemia, nerve damage	Meat, eggs, dairy, fortified cereals
Vitamin C (Ascorbic AciD)	- Boosts immunity, helps in wound healing - Deficiency: Scurvy (bleeding gums, weakness)	Citrus fruits, strawberries, tomatoes

Minerals:

Minerals are natural, inorganic substances that are essential for your body to grow, develop, and stay healthy. Unlike vitamins, which are organic compounds, minerals come from the earth and are absorbed by plants or consumed through animal products.

Minerals play a wide range of roles in the body, such as:

- Building strong bones and teeth
- Supporting muscle function and nerve signals
- Helping the body produce hormones and maintain a healthy heartbeat
- Regulating fluids and energy production

There are two main types of minerals:

1. **Macro minerals (Major minerals)** – Needed in larger amounts

   Examples: **Calcium**, **Potassium**, **Sodium**, **Magnesium**, **Phosphorus**

2. **Trace minerals (Micro minerals)** – Needed in very small amounts

   Examples: **Iron**, **Zinc**, **Iodine**, **Copper**, **Selenium**

MACRO MINERALS:

Mineral Name	Functions & Deficiency Diseases	Sources
Calcium	- Builds strong bones and teeth - Helps muscle contraction and nerve function - Deficiency: Weak bones (osteoporosis), muscle cramps	Milk, cheese, yogurt, leafy greens, tofu
Potassium	- Maintains fluid balance - Supports nerve signals and muscle contractions - Deficiency: Weakness, fatigue, irregular heartbeat	Bananas, oranges, potatoes, spinach, beans
Sodium	- Regulates fluid balance and blood pressure - Helps nerve and muscle function - Deficiency: Rare, but may cause dizziness, confusion	Table salt, processed foods, soups, bread
Magnesium	- Helps in muscle and nerve function - Supports energy production - Deficiency: Muscle cramps, mental disorders, fatigue	Nuts, seeds, whole grains, spinach, dark chocolate
Phosphorus	- Strengthens bones and teeth - Helps in energy production and cell repair - Deficiency: Weak muscles, bone pain	Meat, fish, dairy, eggs, whole grains

MICRO MINERALS

Mineral Name	Functions & Deficiency Diseases	Sources
Iron	Needed for making haemoglobin in red blood cells (carries oxygen) - Deficiency: Anaemia (fatigue, weakness)	Red meat, spinach, beans, lentils, fortified cereals
Zinc	Supports immune function, wound healing, and cell growth - Deficiency: Poor wound healing, hair loss, weakened immunity	Meat, seafood (especially oysters), nuts, whole grains
Iodine	Helps produce thyroid hormones - Deficiency: Goitre (swollen thyroiD), developmental delays	Iodized salt, seafood, dairy products
Copper	Helps with iron absorption and red blood cell formation - Deficiency: Fatigue, anaemia, weak bones	Shellfish, nuts, seeds, whole grains
Selenium	Acts as an antioxidant, protects cells, supports thyroid function - Deficiency: Muscle weakness, heart disease (Keshan disease)	Brazil nuts, seafood, eggs, whole grains

5.3 NUTRATIVE AND NON-NUTRATIVE COMPONENTS OF FOOD

1. Nutritive Components

These are the parts of food that provide nutrients to the body. They help in energy production, growth, and body maintenance.

Main Nutritive Components:

Component	Function
Carbohydrates	Main source of energy
Proteins	Build and repair body tissues
Fats	Provide energy and help absorb vitamins
Vitamins	Support various body functions like immunity and vision
Minerals	Help build bones, make hormones, and regulate heartbeat

2. Non-Nutritive Components

These are substances in food that do not provide nutrition or energy but may affect health positively or negatively.

Examples of Non-Nutritive Components:

Component	Role
Dietary fiber (roughage)	Helps digestion and prevents constipation
Antioxidants	Protect cells from damage
Additives (colors, preservatives)	Improve shelf life or appearance but may cause allergies or health issues in some people
Toxins (natural or artificial)	Harmful if consumed in large amounts (e.g., certain plant toxins, pesticides)
Phytochemicals	Plant compounds that may help prevent diseases
Water	Water helps in digestion, nutrient absorption, temperature regulation, and removal of waste from the body.

Harmful Non-Nutritive Factors:

Harmful non-nutritive factors are substances found in some natural or processed foods that **do not provide any nutritional value** but can be **dangerous or toxic to human health** when consumed in large amounts or without proper preparation.

These substances can:

- ✓ Interfere with nutrient absorption

- ✓ Affect digestion or metabolism
- ✓ Cause allergic reactions or toxicity
- ✓ Lead to long-term health problems if consumed regularly

5.4 Healthy Weight

A **healthy weight** is a body weight that is appropriate for your **height, age, sex, and overall health**. It is the weight at which your body functions best, and it helps reduce the risk of diseases like diabetes, heart disease, and high blood pressure.

Calculating BMI is the best way to determine Healthy weight.

BMI (Body Mass Index)

BMI is the most common tool to assess healthy weight.
It is calculated using your **weight (kg)** divided by your **height (m²)**.

BMI = weight (kg) / height (m²)

5.4.1 BMI Categories:

- ✓ **Underweight:** BMI less than 18.5
- ✓ **Normal (Healthy) weight:** BMI 18.5 – 24.9
- ✓ **Overweight:** BMI 25 – 29.9
- ✓ **Obese:** BMI 30 or more

Example:

A person weighs 60 kilograms and is 1.65 meters tall. Calculate their Body Mass Index (BMI) and determine whether their weight is considered underweight, healthy, overweight, or obese. Explain what the result means in terms of their health.

Solution:

Height = 1.65 meters

Weight = 60 kilograms

BMI = weight (kg) / height (m²)

= 60 kg / 1.65 meters x 1.65 meters

= 22.0

BMI = 22.0

This falls in the "Healthy weight" category (BMI 18.5 – 24.9)

Ways to Maintain a Healthy Body Weight

Maintaining a healthy body weight involves a balance between the calories you consume through food and the calories you burn through physical activity and body functions. Here are some effective ways to achieve and maintain a healthy weight:

1. Eat a Balanced Diet

Include plenty of fruits, vegetables, whole grains, and lean proteins.

Limit sugary drinks, processed foods, and high-fat snacks.

Control portion sizes to avoid overeating.

2. Stay Physically Active

Aim for at least 30 minutes of moderate exercise most days of the week (like walking, cycling, swimming).

Include strength training exercises to build muscle and boost metabolism.

3. Drink Plenty of Water

Water helps control appetite and supports metabolism.

Replace sugary drinks with water whenever possible.

4. Get Enough Sleep

Aim for 7-9 hours of quality sleep per night.

Poor sleep can increase hunger and cravings for unhealthy foods.

5. Manage Stress

Practice relaxation techniques like meditation, yoga, or deep breathing.

Stress can lead to emotional eating and weight gain.

6. Avoid Skipping Meals

Eat regular meals and healthy snacks to maintain steady energy and avoid overeating later.

7. Set Realistic Goals

Aim for gradual weight loss or maintenance, about 0.5 to 1 kg per week.

Celebrate small achievements to stay motivated.

8. Monitor Your Progress

Keep track of your weight, diet, and physical activity.

Adjust habits if you notice weight gain or loss outside your goals.

The Pitfalls of Dieting

1. Yo-Yo Dieting (Weight Cycling)

Losing weight quickly and then gaining it back repeatedly.

Can slow metabolism over time and make future weight loss harder.

2. Nutrient Deficiencies

Extreme or restrictive diets often cut out entire food groups.

This can lead to deficiencies in important nutrients like iron, calcium, or vitamins.

3. Slowed Metabolism

Very low-calorie diets can signal the body to conserve energy.

This slows down metabolism and may result in fatigue and weakness.

4. Loss of Muscle Mass

Without enough protein or exercise, dieting can cause muscle loss instead of fat loss.

Muscle loss can reduce strength and slow metabolism.

5. Mental and Emotional Stress

Strict dieting can lead to food obsession, anxiety, guilt, or depression.

May trigger emotional eating or unhealthy attitudes toward food and body image.

6. Short-Term Results

Fad diets may give quick results but are hard to maintain long term.

Most people regain the weight once they stop the diet.

7. Dehydration

Some diets cause rapid water loss (not fat), especially low-carb diets.

This can lead to dizziness, headaches, and poor concentration.

8. Digestive Problems

Low fibre intake in certain diets can cause constipation.

Sudden dietary changes can upset your digestive system.

FOOD INTOLERANCE:

Food intolerance refers to difficulty digesting certain foods and having an unpleasant physical reaction to them. Unlike a **food allergy**, which involves the immune system, food intolerance is typically a digestive system response. It does **not** cause life-threatening reactions but can significantly affect quality of life.

Cause:

Enzyme deficiency – e.g. lactase (lactose intolerance)

Chemical sensitivity – e.g. histamine, salicylates

Food additives – e.g. MSG, sulfites

FODMAP intolerance – poor absorption of certain carbs

Irritable Bowel Syndrome (IBS) – food triggers symptoms

Caffeine or natural food chemicals – overreaction to stimulants

Spoiled or toxic food – bacteria or toxins cause symptoms

Genetics – inherited enzyme issues (like fructose intolerance)

symptoms of food intolerance:

1. People often experience bloating after eating the problem food.

2. Excessive gas is a common sign of poor digestion.

3. Abdominal pain or cramps may occur a few hours after eating.

4. Some individuals develop diarrhoea or constipation.

5. Nausea can arise shortly after consuming the trigger food.

6. Headaches or migraines may follow food intolerance in sensitive individuals.

7. Many people report feeling fatigued or low on energy.

8. Brain fog, or difficulty concentrating, is another possible symptom.

9. In some cases, food intolerance can cause mild skin rashes or irritation.

FOOD MYTHS

1. Myth: Fat is always bad for health

Truth: The body needs healthy fats (like omega-3, unsaturated fats) for energy, hormone production, and brain function.

Sources: Nuts, seeds, olive oil, fish.

2. Myth: Skipping meals helps in losing weight

Truth: Skipping meals can slow down metabolism and lead to overeating later. It reduces energy and focus, especially for athletes.

3. Myth: Only proteins build muscles

Truth: Carbohydrates provide the energy needed for workouts, and proteins help in repair and growth. Both are essential.

4. Myth: All carbohydrates are bad

Truth: Complex carbs like whole grains, fruits, and vegetables are necessary for energy. Only refined sugars should be avoided.

5. Myth: Drinking water during exercise causes cramps

Truth: Staying hydrated prevents cramps. Lack of water and electrolytes is the real reason for muscle cramps.

6. Myth: Natural/organic food has no calories

Truth: Natural foods still have calories. Eating too much, even of healthy food, can lead to weight gain.

7. Myth: Supplements are essential for athletes

Truth: A balanced diet is usually enough. Supplements should only be taken on the advice of a doctor or dietician.

8. Myth: Eating late at night leads to fat gain

Truth: It's not about when you eat, but how much and what you eat. Total calorie intake and activity matter more.

9. Myth: More protein = more strength

Truth: Excess protein is not stored as muscle—it's either used for energy or stored as fat. Balanced intake is the key.

10. Myth: Detox diets cleanse your body

Truth: The liver and kidneys already detox the body. Detox diets are often unnecessary and sometimes unsafe.

5.5 - IMPORTANCE OF DIET IN SPORTS

Focus: Pre, During & Post Sports Competition Diet

1. Pre-Competition Diet (Before Sports)

Objective: To provide energy, keep the stomach light, and prevent fatigue during performance.

Required Diet :

a. High Carbohydrates:

Carbs are the main energy source.

Include foods like rice, pasta, oats, bananas, bread.

b. Moderate Protein:

Helps maintain muscle strength.

Eggs, milk, nuts, paneer in moderate quantity.

c. Low Fat & Fiber: Fatty and high-fiber foods slow digestion and may cause discomfort.

d. Well-timed Meal (3–4 hours before):

Large meal 3–4 hours before competition.

Light snack 30–60 minutes before (e.g., banana, energy bar).

e. Hydration:

Drink sufficient water before the event.

Avoid carbonated or caffeinated drinks.

2. Diet During Competition (In Between or Long-duration Events)

Objective: To maintain energy and hydration during play.

Required Diet :

a. Easily Digestible Carbohydrates: Sports drinks, glucose water, fruits like oranges or bananas.

b. Avoid Solid Food: Difficult to digest during high activity.

c. Electrolyte Replacement: Use drinks with sodium, potassium to replace sweat loss.

d. Small Frequent Intake: Small sips of water or drinks every 15–20 minutes during breaks.

e. Personalized Plan: Endurance athletes (marathoners, cyclists) may need energy gels, bars.

3. Post-Competition Diet (After Sports)

Objective: To recover energy, repair muscles, and rehydrate body.

Required Diet :

a. **High Carbohydrates:** Replenish glycogen stores lost during activity.

b. **High Protein:** Repairs muscle tissues and aids recovery.

Include eggs, milk, lean meat, pulses.

c. **Rehydration:** Drink plenty of water or ORS (Oral Rehydration Solution) with electrolytes.

d. **Balanced Meal within 30–60 Minutes:** Ideal time for recovery meal/snack post-event.

e. **Antioxidant-rich Foods:** Helps reduce inflammation (e.g., berries, turmeric milk, green leafy veggies).

SUMMARY TABLE

Time	Focus	Foods
Pre	Energy & Digestion	Carbs, light proteins, low-fat foods
During	Hydration & Quick Energy	Water, glucose, electrolyte drinks, fruits
Post	Recovery & Rehydration	Carbs, proteins, fluids, antioxidants

QUESTIONS AND ANSWERS

Solved Multiple Choice Questions 1 Mark

1. What is the main source of energy for athletes?
A) Protein B) Carbohydrates C) Vitamins D) Minerals
Answer: B) Carbohydrates

2. Which nutrient is primarily responsible for muscle repair?
A) Fats B) Carbohydrates C) Proteins D) Water
Answer: C) Proteins

3. Which one is a micronutrient?
A) Protein B) Fat C) Vitamin C D) Carbohydrate
Answer: C) Vitamin C

4. What is the function of fiber in the diet?
A) Provides energy B) Builds muscle C) Aids digestion D) Improves bone strength
Answer: C) Aids digestion

5. Which of the following is an example of a food rich in fats?
A) Apple B) Olive oil C) Rice D) Lentils
Answer: B) Olive oil

6. What percentage of an athlete's diet should consist of carbohydrates?
A) 10–15% B) 20–30% C) 40–45% D) 55–60%

Answer: D) 55–60%

7. Which is vitamin that is water-soluble?
A) Vitamin A B) Vitamin D C) Vitamin C D) Vitamin E
Answer: C) Vitamin C

8. What is the primary role of iron in the body?
A) Boosts immunity B) Strengthens bones
C) Helps in oxygen transport D) Supports vision
Answer: C) Helps in oxygen transport

9. Which is the food that is most suitable after a sports activity for muscle recovery?
A) Chocolate B) Banana C) Chicken D) Soft drink
Answer: C) Chicken

10. What is the main cause of lactose intolerance?
A) Allergy to milk protein B) Lack of lactase enzyme
C) Excessive calcium D) Overeating dairy products
Answer: B) Lack of lactase enzyme

11. Which is the mineral essential for bone health?
A) Zinc B) Calcium C) Iron D) Sodium
Answer: B) Calcium

12. Which of the following is a function of water in the body?
A) Builds muscle B) Provides calories
C) Regulates body temperature D) Builds bones
Answer: C) Regulates body temperature

13. A balanced diet includes:
A) Only plant-based foods B) Equal portions of carbohydrates and fats only
C) All nutrients in proper proportions D) Only protein-rich foods
Answer: C) All nutrients in proper proportions

14. Which of the following is a sign of food intolerance?
A) Fever B) Hives C) Sneezing D) Bloating
Answer: D) Bloating

15. What is the most essential nutrient for hydration in athletes?
A) Protein B) Calcium C) Water D) Fat
Answer: C) Water

UNSOLVED MULTIPLE-CHOICE QUESTIONS (FOR PRACTICE):

16. Which is the nutrient that helps in the absorption of fat-soluble vitamins?
A) Water B) Carbohydrates C) Fats D) Proteins

17. Which of the following is a good source of protein for vegetarians?
A) Chicken B) Eggs C) Lentils D) Fish

18. Which is the vitamin that is produced in the body with sunlight exposure?
A) Vitamin A B) Vitamin B12 C) Vitamin D D) Vitamin K

19. What should athletes consume during long-duration sports events?
A) Fats B) Fiber C) Energy drinks or glucose D) Cheese

20. Which is the food suitable for someone with gluten intolerance?
A) Wheat bread B) Pasta C) Rice D) Barley

SOLVED VERY SHORT ANSWER QUESTIONS (2 MARKS)

1. What is a balanced diet?
Answer: A balanced diet includes all essential nutrients in proper proportions for good health.

2. Name one energy-giving nutrient.
Answer: Carbohydrates.

3. Which nutrient is essential for muscle repair?
Answer: Protein.

4. What is the main function of vitamins in the body?
Answer: They help regulate body functions and boost immunity.

5. Give one example of a macronutrient.
Answer: Fat.

6. Name a food rich in calcium.
Answer: Milk.

7. What is food intolerance?
Answer: It is the inability to digest certain foods properly.

8. Which mineral is necessary for oxygen transport in the blood?
Answer: Iron.

9. What is the percentage of water in the human body?
Answer: About 60–70%.

10. What should athletes consume after exercise for recovery?
Answer: Protein-rich foods like eggs or lean meat.

UNSOLVED VERY SHORT ANSWER QUESTIONS

11. What is the function of dietary fiber?
Answer: _____

12. Name a vitamin that is fat-soluble.
Answer: _____

13. What is the role of water in the body?
Answer: _____

14. Name the nutrient that is the body's main source of energy during exercises?
Answer: _____

15. Name one symptom of lactose intolerance.
Answer: _____

SOLVED SHORT ANSWER QUESTIONS (3 MARKS)

1. What is the importance of a balanced diet in sports?
Answer: A balanced diet provides the necessary energy, supports muscle repair, enhances performance, prevents injuries, and speeds up recovery for athletes.

2. Differentiate between macronutrients and micronutrients.
Answer: Macronutrients (carbohydrates, proteins, fats) are required in large amounts and provide energy. Micronutrients (vitamins and minerals) are needed in smaller amounts and support body functions like immunity and bone health.

3. How does hydration affect sports performance?
Answer: Proper hydration maintains body temperature, improves endurance, prevents cramps, and supports concentration and muscle function during physical activity.

4. What are the causes and symptoms of food intolerance?
Answer: Food intolerance occurs due to the inability to digest certain food components like lactose or gluten. Symptoms include bloating, gas, stomach cramps, and diarrhea.

5. What is the role of proteins in an athlete's diet?
Answer: Proteins help build and repair muscles, support recovery after exercise, and are essential for the maintenance of body tissues.

6. List any three components of a nutritive diet and give one example of each.
Answer:

Carbohydrates – Rice

Proteins – Eggs

Fats – Nuts

UNSOLVED SHORT ANSWER QUESTIONS 3 MARKS

7. Explain any two functions of vitamins in the human body.
Answer: _____

8. What are the dietary precautions that should be taken by someone with gluten intolerance?
Answer: _____

9. Mention three healthy eating habits that promote long-term health.
Answer: _____

SOLVED CASE-BASED QUESTIONS (4 MARKS)

Case 1:

Rahul is a national-level swimmer who practices for 3 hours daily. His coach advised him to increase his intake of carbohydrates and proteins. Rahul also noticed that when he skips meals or doesn't hydrate properly, he feels tired and dizzy during training.

Q1. Why did Rahul's coach advise him to consume more carbohydrates and proteins?
A) To improve sleep quality B) To boost flexibility
C) For energy and muscle recovery D) To improve height
Answer: C) For energy and muscle recovery

Q2. What is the role of carbohydrates for an athlete?
A) Builds bones B) Provides long-lasting energy
C) Helps in joint movement D) Improves balance
Answer: B) Provides long-lasting energy

Q3. What happens if an athlete is dehydrated during training?
A) Improved focus B) Muscle growth
C) Tiredness and dizziness D) Better stamina
Answer: C) Tiredness and dizziness

Q4. Which of the following helps in muscle repair?
A) Carbohydrates B) Proteins
C) Fats D) Vitamins
Answer: B) Proteins

Case 2:

Meena is a 16-year-old athlete who recently started experiencing bloating and stomach cramps after drinking milk. Her doctor diagnosed her with lactose intolerance.

Q1. What is lactose intolerance?
A) Allergy to nuts B) Inability to digest gluten
C) Inability to digest milk sugar D) Deficiency of protein
Answer: C) Inability to digest milk sugar

Q2. Which of the following is a symptom of lactose intolerance?
A) Strong bone B) Clear skin
C) Stomach cramps after drinking milk D) Increased appetite
Answer: C) Stomach cramps after drinking milk

Q3. Which is a suitable calcium-rich alternative for lactose-intolerant people?
A) Chees B) Butter C) Almonds D) Ice cream
Answer: C) Almonds

Q4. Which vitamin helps absorb calcium effectively?
A) Vitamin A B) Vitamin D C) Vitamin C D) Vitamin K
Answer: B) Vitamin D

Case 3:

Karan is preparing for a marathon. He eats balanced meals but often eats fried snacks and skips post-training recovery meals. His performance is declining.

Q1. What is the major drawback of regularly eating fried snacks?
A) Boosts energy B) Helps build muscles
C) Adds unhealthy fats D) Improves digestion
Answer: C) Adds unhealthy fats

Q2. What is the function of a post-training meal?
A) Helps in improving memory
B) Helps in muscle recovery and energy replenishment
C) Helps with eyesight
D) Enhances height
Answer: B) Helps in muscle recovery and energy replenishment

Q3. What is the main nutrient required for recovery after training?
A) Protein B) Water C) Fibre D) Fat
Answer: A) Protein

Q4. Skipping recovery meals can result in:
A) Fast recovery B) Muscle fatigue and slower performance

C) Increased flexibility D) Better sleep
Answer: B) Muscle fatigue and slower performance

Case 4:

A group of school athletes underwent a diet assessment. It was found they were not consuming enough iron and vitamin C. Some of them complained of tiredness and frequent illness.

Q1. Why is iron important for athletes?
A) Increases height B) Helps oxygen transport in blood
C) Improves skin tone D) Boosts eyesight
Answer: B) Helps oxygen transport in blood

Q2. A sign of iron deficiency is:
A) Increased strength B) Strong bones
C) Fatigue and tiredness D) High blood pressure
Answer: C) Fatigue and tiredness

Q3. What role does vitamin C play in the body?
A) Builds fat B) Strengthens immunity and helps absorb iron
C) Weakens digestion D) Increases blood sugar
Answer: B) Strengthens immunity and helps absorb iron

Q4. Which of these foods is rich in iron?
A) Apples B) Spinach C) Milk D) Rice
Answer: B) Spinach

UNSOLVED CASE-BASED QUESTIONS

Case 5:

Sneha, a state-level basketball player, avoids eating before matches thinking it will keep her be light and fast. However, she often feels weak midway through the game.

1.What is a common effect of skipping meals before intense physical activity?
A) Improved speed B) Increased focus
C) Fatigue and weakness D) Enhanced stamina

2. Which of the following should be avoided right before a match?
A) Complex carbohydrates B) Water
C) Sugary and fried food D) Bananas

3.What type of nutrients should a pre-match meal mainly consist of?
A) Fats and salt B) Proteins and complex carbohydrates
C) High sugar snacks D) Processed foods

4. Why is it important for athletes to fuel up before a game?
A) To avoid dehydration only B) To stay full during the match
C) To maintain energy levels and performance D) To gain muscle immediately

Case 6:

A school conducted a workshop on healthy eating habits. Students were asked to track their daily intake and noticed many were consuming sugary drinks and processed foods.

1. What can be a long-term result of consuming sugary drinks daily?
A) Increased strength B) Obesity and tooth decay
C) Height growth D) Better digestion

2.Which of the following is a healthy alternative to chips and candies?
A) Soft drinks B) Fried samosa
C) Fruits and nuts D) Chocolates

3.Why are processed snacks considered unhealthy?
A) They contain fresh ingredients B) They are low in calories
C) They are high in sugar, salt, and unhealthy fats D) They improve heart health

4.What should be the goal of tracking one's daily food intake?
A) To eat less food B) To focus only on calories
C) To balance nutrients and develop healthy habits D) To avoid home-cooked meals

SOLVED LONG ANSWER QUESTIONS (5 MARKS)

1. Explain the importance of a balanced diet for sportspersons. List the components of a balanced diet and their roles.

Answer:

A balanced diet is a diet that includes all essential nutrients — carbohydrates, proteins, fats, vitamins, minerals, fiber, and water — in the right proportions to support healthy body functioning. For sportspersons, a balanced diet is critical because it fuels their workouts, aids recovery, and improves performance.

Importance of a Balanced Diet for Sportspersons:

Energy Supply: Athletes require more energy to sustain long hours of physical training. A balanced diet ensures sufficient calorie intake for energy and endurance.

Tissue Growth and Repair: Protein and certain micronutrients help in repairing muscle tissue damaged during strenuous activity.

Enhanced Immune Function: A healthy immune system protects athletes from frequent infections and illnesses.
Improved Focus and Concentration: Proper nutrition supports brain function, helping in better decision-making and coordination during sports.

Faster Recovery: Nutrients like proteins, antioxidants, and omega-3 fats help reduce inflammation and speed up recovery.

Components of a Balanced Diet and Their Roles:

Carbohydrates:

Primary source of energy.

Found in: rice, bread, pasta, fruits.

Proteins:

Required for muscle building and repair.

Found in: eggs, lean meat, dairy, legumes.

Fats:

Provide long-term energy, support cell structure, and aid in nutrient absorption.

Found in: nuts, oils, seeds, avocados.

Vitamins:

Regulate body functions and strengthen immunity.

Found in: fruits, vegetables, dairy.

Minerals:

Essential for bone health, nerve function, and blood oxygenation (e.g., calcium, iron).
Found in: green leafy vegetables, dairy, nuts.

Fiber:

Aids digestion and keeps the gut healthy.

Found in: whole grains, fruits, and vegetables.

Water:

Maintains hydration, regulates temperature, and helps transport nutrients.

Conclusion:
For athletes, eating a balanced diet is not just about staying healthy; it's a key factor that determines performance, stamina, and recovery. The right mix of nutrients can give a competitive edge.

2. Differentiate between macronutrients and micronutrients. Explain their importance in an athlete's diet with examples.

Answer:

Nutrients are substances that the body needs to function properly. They are broadly classified into macronutrients and micronutrients, based on the quantity required by the body.

Macronutrients:

Definition: Nutrients needed in large amounts.
Types: Carbohydrates, proteins, and fats.
Functions:

Carbohydrates: Main source of energy. Athletes rely on carbs for sustained energy (e.g., bread, fruits, pastA).
Proteins: Essential for muscle repair and growth (e.g., eggs, chicken, tofu).
Fats: Provide backup energy, protect organs, and aid hormone production (e.g., nuts, oil, dairy).
Micronutrients:

Definition: Nutrients required in small amounts but vital for health.
Types: Vitamins and minerals.
Functions:
Vitamins: Help in metabolic processes. For instance, Vitamin C strengthens immunity; Vitamin D supports bone health.
Minerals: Support body functions such as oxygen transport (iron) and nerve signaling (calcium, potassium).
Importance in an Athlete's Diet:

Macronutrients are critical for energy production, endurance, muscle development, and overall physical output.

Micronutrients ensure proper cellular function, quicker recovery, and disease prevention.
Example:
An athlete might eat pasta (carbohydrate) before a game for energy, drink milk (calcium) for bone health, and consume fruits (vitamins) to stay immune-strong.

Conclusion:
Both macronutrients and micronutrients are essential for athletes. While macros provide fuel and structural support, micros ensure that the body systems run smoothly for maximum performance.

3. What is food intolerance? How is it different from food allergy? Mention common types, symptoms, and dietary adjustments.

Answer:

Food intolerance is a digestive system response in which the body has difficulty digesting certain foods. It is generally less severe than a food allergy and does not involve the immune system.

Difference Between Food Intolerance and Allergy:

Aspect	Food Intolerance	Food Allergy
System Involved	Digestive system	Immune system
Reaction Time	Gradual (hours after eating)	Immediate (within minutes)
Severity	Mild to moderate	Can be severe or life-threatening
Common Symptoms	Bloating, gas, cramps	Hives, swelling, breathing difficulty

Common Types of Food Intolerance:

Lactose Intolerance:
Caused by deficiency of lactase enzyme; person cannot digest milk sugar.

Gluten Sensitivity:
Causes bloating, discomfort after eating wheat products (non-celiaC).

Fructose Intolerance:
Reaction to fruits or foods high in fructose sugar.

Symptoms:
Bloating
Diarrhea
Stomach cramps
Gas
Nausea
Dietary Adjustments:
Avoid trigger foods (e.g., dairy for lactose intolerance).
Use alternatives (e.g., almond milk, gluten-free grains).
Read food labels carefully.

UNSOLVED LONG ANSWER QUESTIONS

4. Describe the role of nutrition in maintaining physical fitness. How does poor nutrition affect athletic performance?

Answer: _____

5. Discuss the significance of hydration before, during, and after sports activities. What are the consequences of dehydration in athletes?

Answer: _____