PHYSICAL EDUCATION

SPORTS & NUTRITION

Sports And Nutrition

Sports and nutrition both are interrelated. Without proper nutrition sportsman will not be able to perform well, no matter how skill-full an Athlete he is.

Every physical activity needs energy to perform, and without proper nutrition, our body is unable to release sufficient energy.

Nutrition plays a very vital role in our growth and development. It is required to maintain good health.

Nutrition is the science of food in which consumed food is digested, nutrients are absorbed and distributed to the tissue for utilisation.

Nutrition And Diet:

Nutrients are the chemical compounds in foods which are most essential for our life and health. It provides us with energy for work, It is the building blocks for repair and growth.

There are five major nutrients:

Carbohydrates, Fats, Proteins, Vitamins, Minerals. Nutrients are divided into two categories Macro and Micronutrients.

Balance Diet

A balanced diet in nutrition is a diet which contains all nutrients (macro and micro) in a correct proportion for efficient working of the body.

In other words, it is the intake of the appropriate type and adequate amount of food, to supply energy and to support growth and development of an individual.

Functions of Balance Diet:

- It provides sufficient energy It helps in optimum growth and development.
- It improves the proper functioning of organs.
- It helps to recover fast. The immune system becomes strong.
- It improves health status.
- It also improves metabolism.
- It prevents a deficiency disease.
- Helps in maintaining body weight.

- The overall efficiency of the body improves.

Factor affecting diet:

The type of Tournament depends upon various factors like fund available, time periods, infrastructure, staff, facilities, level of teams etc.

- Age.
- Gender.
- Workout or Profession.
- Bodyweight.
- Specific sports diet.
- Sufficient roughage.
- Pregnant or feeding mother.
- Diet during a health problem.
- Seasonal food.
- Climatic conditions.

Nutritive Components of Diet

- Carbohydrates.
- Fat.
- Protein.
- Vitamin.
- Mineral.

Carbohydrates:

Carbohydrates are the main source of nutrition. It supplies energy for all types of physical and mental activities. It is the major fuel for muscular contraction.

It provides instant energy, but this energy does not store for a long. Carbohydrates are also termed as energy-yielding food.

Carbohydrates are the compound of Carbon(C), Hydrogen(H), Oxygen(O). One gram of carbohydrates provides 4 calories of energy.

That means, if we consume 400 gram during a day, we get 1600 calories from only carbohydrates. So, we have to be very calculative while taking it.

It should be taken as per our physical activities. Extra carbs which don't burn will convert into Fats.

Types of Carbohydrates:

Simple Carbohydrates:

This kind of carb in nutrition provides immediate energy. There are various kinds of sugar present in this, like Glucose, fructose, lactose, galactose. These carbs are soluble in water.

Sources: Fruits, low fat milk, table sugar, honey, jam, vegetables like potatoes, candy, etc.

Complex Carbohydrates:

Complex carb is starch which contains various types of sugar molecules to form glycogen. This glycogen releases slow energy as compared with simple carb. They are not soluble in water.

Sources: Bread, cereals, vegetables, whole pulses.

Proteins:

Protein cares the basic structure of all living cells. They are complex organic compounds which form chains of amino acids which contain Carbon, Hydrogen and Nitrogen. It is also called bodybuilding food.

One gram of protein provides 4 Kcal. Thus, if you take 50 gram of protein, you are getting 50 × 4 = 200 calories.

Daily protein requirements depend upon individual activities. One kilogram of body weight needs one gram of protein.

Thus, if your body weight is 70 kg you need 70 gram of protein every day, and if your workout is heavy, you need even more protein than normal.

(CAUTION: High Intake of protein creates an overload on Kidney and liver. Also, it leads to dehydration.)

Protein deficiency diseases are MARASMUS and KWASHIORKOR.

Types of protein:

There are two types of protein-

1. **Essential protein:**

There are 9 essential amino acids which we have to take from external food sources because they are not produced in our body.

The sources of essential proteins are pulses, milk, dairy products, soybeans, egg, meat, etc. They are required for the growth of tissues.

2. Non-essential proteins:

There are more than 13 non-essential proteins, the body requires them in less quantity. It helps in the synthesis of essential protein.

The sources of non-essential proteins are grain, dry fruits, vegetables.

Fats

Fat contains Carbon, Hydrogen and Oxygen. It is one of the important sources of nutrition. Fats are energy yielding food which stores inside our body and are used as an emergency source of energy. It converts into fatty acid.

One gram of fat provides 9 kcal. Thus, if you take 50 gram of protein, you are getting 50 × 9 = 450 calories.

Types of Fatty acids:

There are two types of fatty acid present in food:

Saturated fatty acid:

They contain chains of Carbon atoms. Intake of saturated fat increases the chances of heart disease due to an increase in high cholesterol in the blood. It provides high-density lipoprotein (HDL).

Sources: Animal fat, full cream milk, cream, butter, coconut oil, palm oil, ghee and all fast foods.

Unsaturated Fatty Acid:

It provides low-density lipoprotein (LDL) which is good for our body. It helps in lowering blood cholesterol.

It is further divided into two categories

- Polyunsaturated Fatty acid.
- Monounsaturated Fatty acid.

Sources: Peanut oil, olive oil, Soya oil etc.

Vitamins

Vitamins are complex compounds of Carbon. It is micronutrients. Vitamins are very essential for the normal functioning of our body. Absence of any kind of vitamin causes certain deficiency disease.

Vitamins are divided into two groups:

Fat Soluble Vitamin – These are Vitamins mins A, D, E and K. These vitamins are soluble in fat.

Water-Soluble Vitamin These Vitamins are soluble in water. These Vitamins are vitamin B and C.

Fat Soluble Vitamin

Vitamins	Helps	Deficiency	Sources
Vitamin A	Eyes and skin	Night blindness	Milk, butter, egg, carrot, tomatoes
Vitamin D	Strong bones and teeth	Rickets	Milk, Butter, vegetables, sunlight.
Vitamin E	Protect cell membrane	Anaemia	Milk, Butter, meat
Vitamin K	Blood clotting and heal wounds	Anaemia	Cabbage, soyabean, fish, wheat, egg, meat

Water Soluble Vitamin

Vitamins	Helps	Deficiency	Sourses
Vitamin C	Healing wounds, maintain ligaments, tendons	Scurvy	Lemon, orange, Amla, tomatoes
VITAMIN B COMPLEX			

Vitamin B1 (Thiamine)	Metabolism of Carbohydrates. Maintains liver, Kidney	Beri-Beri	Black beans, lentils, Asparagus
Vitamin B2 (Riboflavin)	Growth of Red Blood Cells (RBC)	Retarded growth	Cereal, bread, egg, vegetables
Vitamin B3 (Niacin)	Lower cholesterol, ease arthritis and boost brain function	Pellagra (lost skin sensitivity)	Meat, poultry, red fish, cereals
Vitamin B5 (Pantothenic)	Making blood cells	Insomnia, Depression	Cereals, mushrooms, nuts, milk
Vitamin B6 (Pyridoxine)	Form haemoglobin	Lips corner crack, Depression	Fish, peanut, soyabean, Oats
Vitamin B7 (Biotin)	Metabolize fats, carbohydrates, and protein	Hair loss, red rash in the face	Bread, cauliflower, mushrooms
Vitamin B9 (Folic Acid)	Reproduction, growth, and development	Anaemia	Beans, peanut, sunflower seed, seafood
Vitamin B12 (Cobalamin)	Metabolism, energy transfer	Reduction in blood cells	Meat, fish, milk, cheese

Minerals

Minerals are required for healthy teeth, bone, and muscles. It helps the transmission of nerve impulses, the formation of hormones, maintenance of Heartbeat etc.

Mineral are classified into two groups macro and micro-Minerals.

Macro Minerals

Minerals	Helps In	Deficiency	Sources
Calcium	Growth and development of bones and teeth	Rickets	Cheese, milk, yoghurt, cereals, vegetables
Potassium	Make nervous system strong	Fatigue, muscle cramps and abnormal heart rhythms.	Banana, tomatoes, peanut
Sodium	Muscular activities and transmission of nerve impulses	Nausea, headache and fatigue	Table salt, pickles, Butter
Magnesium	Repairs and maintain body cells	Fatigue, muscle cramps, mental problems	Meat, brown rice, whole grain
Phosphorus	Formation of bones and teeth	Rickets, osteoporosis	Fish, milk, cod liver, egg

Micro Minerals

Minerals	Helps In	Deficiency	Sources
Iodine	Production of hormones in the thyroid gland.	Goitre (Swollen Thyroid Gland)	Iodised salt, sea food
Iron	Production of haemoglobin	Anaemia	Liver, meat, banana, spinach

Chromium	Stimulates insulin activities	Diabetes	soyabean, carrots, Bajra, barley.

Non-Nutritive Components of Diet

Components which do not provide energy

Water

Our body consist of 70% of water in total body weight. An n adult needs 2 – 3 litres of water daily for a normal life.

Water in the blood helps in the transportation of nutrients to various cells of the body.

Importance of water:

- Excretion of waste products.
- Regulates body temperature.
- Transportation of nutrients
- Maintains body fluids
- Eliminates body toxin
- Lubrication of joints
- Improves skin quality
- Kidney function improves
- Boost physical performance
- Improve digestion

Roughage

It is known as fibre, which is a very important part of nutrition. It is the indigestible portion of food.

Fibre comes from the part of plant-based foods. It helps in digestion, prevent constipation, and helps to manage cholesterol levels.

Eating for weight control

A stable weight based on a balance between the energy which you get from food and the energy you use. We must provide good nutrition for our body to maintain a healthy weight.

If calorie consumption is more than calorie burn, than our body stores extra calories, and converts them into fat. When a person burns up more calories than they consume, they lose weight.

We use energy during a day in three ways

- Energy expended during rest (Basal Metabolism)
- Energy used to break down food (Thermogenesis)
- Energy used during activities

Healthy weight

Healthy weight leads a healthy life with a reduced risk of diseases. It means that an individual who has a healthy weight, he can lead a healthy life.

Healthy weight lowers an individual's risk of various health problems, such as heart disease, stroke, high blood pressure, diabetes, etc.

A healthy weight can be calculated by Body Mass compound. BMI can be calculated by…

BMI = Weight (Kg) / Height in m^2

Category	Men	Women
Under weight	Below 20	Below 18
Healthy weight	20 – 25	19 – 24
Overweight	26 – 29	25 – 29
Obese	30 above	30 above

Methods to control healthy body weight:

- Take a balanced diet.
- Drinks lots of water.
- Eat a lot of fibrous food.

- Regular Medical Check-up.
- Avoid Fatty foods.
- Do regular physical Activity.
- Avoid drinking alcohol.
- Avoid junk food.
- Eat meals in small shifts.
- Do not do crash dieting.
- Never try slimming pills.
- Avoid overeating.

Pitfall Of Dieting

An individual who is overweight wants to reduce weight by any means and methods, without realising its side effects.

They starve to reduce weight. Many times, they skip meals to lose weight, sometimes take slimming pills. This causes serious health problems.

Major Pitfalls of Dieting:

- Extreme Reduction of Calories sometimes takes less than 1000 calories a day.
- Restriction on some nutrients like Carbohydrates, fat
- Often skipping meals
- Intake only liquid food
- Intake of only labelled and processed foods.
- Consume low energy diet

Food Intolerance:

Food Intolerance is when a person has difficulty in digesting a particular food. Food cannot be properly digested by the digestive system.

The main cause of food intolerance in any human being is the complete absence of enzymes, which is responsible for breaking down or absorbing the food elements.

Symptoms: Nausea, Vomiting, Pain in joints, headache and rashes on the skin, Diarrhoea, sweating, palpitations, burning sensations on the skin stomach.

Food Myths:

Myth: Eggs increases cholesterol level.

Fact: Eggs are one of the best sources of energy. Egg provides various nutrients, so taking at least one egg daily is advisable.

Myth: Food which has very low fat or no fat is good.

Fact: Our body needs fats for energy, tissue repair and to transport vitamin A.D, E, K.

Myth: Crash Dieting or Fasting lose weight.

Fact: It may give fast results but has a lot of side effects.

Myth: Food eaten late-night is more fattening.

Fact: It doesn't make much change.

Myth: Low-fat milk has less calcium than full-fat milk.

Fact: Skimmed and semi-skimmed have more calcium

Myth: Vegetarians cannot build muscles.

Fact: Vegetarians can build muscles by eating veg food rich in proteins, like pulses, nuts, milk

Myth: Healthy food is very expensive.

Fact: All tinned, stored, packed food is expensive. Whereas local & seasonal foods are not so expensive.