

# SBG STUDY

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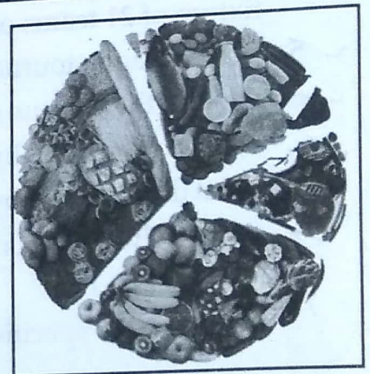
## Sports and Nutrition

### Chapter at a Glance

- 2.1 Balanced Diet and Nutrition : Macro and Micronutrients
- 2.2 Nutritive and Non-nutritive Components of Diet
- 2.3 Eating for Weight Control – A Healthy Weight, the Pitfalls of Dieting, Food Intolerance and Food Myths
- 2.4 Sports Nutrition & its effect on performance (Fluid and Meal Intake, Pre-competition, During competition and Post-competition)
- 2.5 Food Supplement for Children

### INTRODUCTION

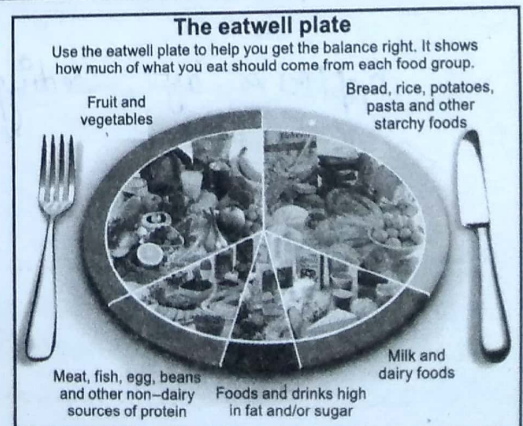
All living beings need food to get energy to maintain their body for doing work. The food which we eat is known as 'diet'. We need food not only to get the supply of energy, but also for the growth and development of the body. Food is necessary for the formation of new cells. The food which we take, repairs injured cells of our body. The energetic food in our diet consists of various types of essential chemicals for our body termed as 'Nutrients.' It also regulates the various activities of the body. An individual should take balanced food, which has all the essential nutrients (proteins, mineral, carbohydrates, fats, vitamins and water) in right proportion for proper growth and development.



### 2.1 BALANCED DIET AND NUTRITION: MACRO AND MICRO NUTRIENTS

#### Meaning of Balanced Diet

**Balanced Diet:** "A diet which consists of all the essential food elements, e.g. proteins, carbohydrates, vitamins, fats, minerals and water in proportionate amount is called a balanced diet." A balanced diet must contain all the essential elements in right amount. It means getting the right amounts of food and drinks to supply nutrition and energy for maintaining body cells, tissues, organs for supporting normal growth and development. Cooking of food is also necessary because it sterilises foodstuff and makes it easily digestible.



Balanced Diet

### Factor Affecting Diet

Diet depends on the following factors:

- (i) **Age:** A growing child needs more protein in his food as compared to older people. This protein is needed to make the body tissues of the growing child. A growing child also needs more minerals such as calcium and phosphorus for the formation of bones than a young adult.
- (ii) **Gender:** Gender (sex) difference causes variation in diet. Male needs more calories as compared to females due to physiological and activity needs of body.
- (iii) **Profession:** A person doing active physical work such as player, worker, and carpenter needs more carbohydrates and fats in his diet than a person doing inactive work such as teachers, advocates, doctors, judges, engineers, etc.
- (iv) **Health Status:** Health status affects the diet of a person. The persons recovering from illness need more proteins, minerals and vitamins in their diet to repair the damaged cell caused by illness. Even in growing age, the children need more food than adults.
- (v) **Climate:** The diet also depends upon the climate which we live in. In hot climate, we should take such a balanced diet, which has less fat. If we live in cold climate, we need more quantity of protein and fats.
- (vi) **Body Structure:** The weight also brings difference in diet. Overweight or obese person should take fibrous food whereas slim or lean (underweight) person needs more proteins and fats.
- (vii) **Pregnant or Feeding Mother:** A pregnant or feeding mother needs extra diet, *i.e.* more amount of carbohydrates, proteins, fats, vitamins and minerals.

**Conclusion:** The amount and percentage of the various constituents of diet depend upon the physical condition of person, sex, age, occupation of a person and climatic conditions of the place where the individual lives. No strict rule can be formed about the real requirements of diet by a person in every day life.

### Importance of Balanced Diet

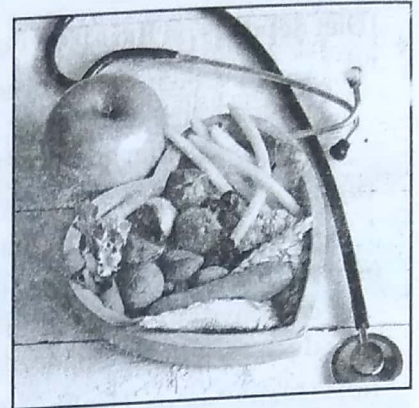
A balanced diet is important because it enables us to meet our daily nutritional needs and enjoy overall quality of life. A balanced diet provides proper sleep, prevention from natural disease and helps to control weight. Detailed explanation of these points are as follows:

- (i) **Quality of Life:** A balanced diet is the foundation of good health and well-being. Taking a balanced diet is important because it allows us to enjoy life by providing sufficient energy. We feel less stressed and achieve more in lesser period of time. We will have lesser chance of illnesses.
- (ii) **Meeting Nutritional Needs:** Our daily food intake should include grain, fruit, milk (or other dairy products), vegetable, beans, oils and protein. Healthy food contain vitamins and minerals that boost up immunity and serves as natural protective from many common illnesses.
- (iii) **Weight Control:** Eating a balanced diet can be an important step towards weight loss. A balanced diet helps us to maintain weight in the long-term. If we are underweight/overweight, eating a balanced diet can help increase/decrease weight respectively and keeps our health and maintain the weight in the long-term.
- (iv) **Proper Sleep:** Eating a balanced diet enables us not only to sleep soundly without the use of sleeping pills but also makes us feel more fresh when we wake up.
- (v) **Disease Prevention:** Eating a balanced diet is the easiest way to protect ourselves from many diseases. Balanced diet boosts up our energy level and ensures our body functions normally. Lacking of any specific nutrient can cause deficiency diseases; and unbalanced diet can result in malnutrition.

## Nutrition

**Nutrition** is the process of breaking-down food and substances taken in to use for energy in the body. The diet of an organism is what it eats. Good diet provides good nutrition to the body and bad diet provides poor nutrition.

A poor or bad diet may have an injurious impact on health. Malnutrition, *i.e.*, lack in nutrition causes deficiency diseases such as scurvy, and many more kwashiorkor. Bad diet or poor nutrition causes health-threatening conditions like obesity and metabolic syndrome and common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis.



Nutrition

The human body contains chemical compounds, such as water, carbohydrates (sugar, starch, and fiber), amino acids (in proteins), fatty acids (in lipids), and nucleic acids (DNA and RNA). These compounds in turn consist of elements such as carbon, hydrogen, oxygen, nitrogen, phosphorus, calcium, iron, zinc, magnesium, manganese, and so on. All of these chemical compounds and elements occur in various forms and combinations (e.g. hormones, vitamins, phospholipids, hydroxyapatite), both in the human body and in the plant and animal organisms that humans eat, provides nutrition.

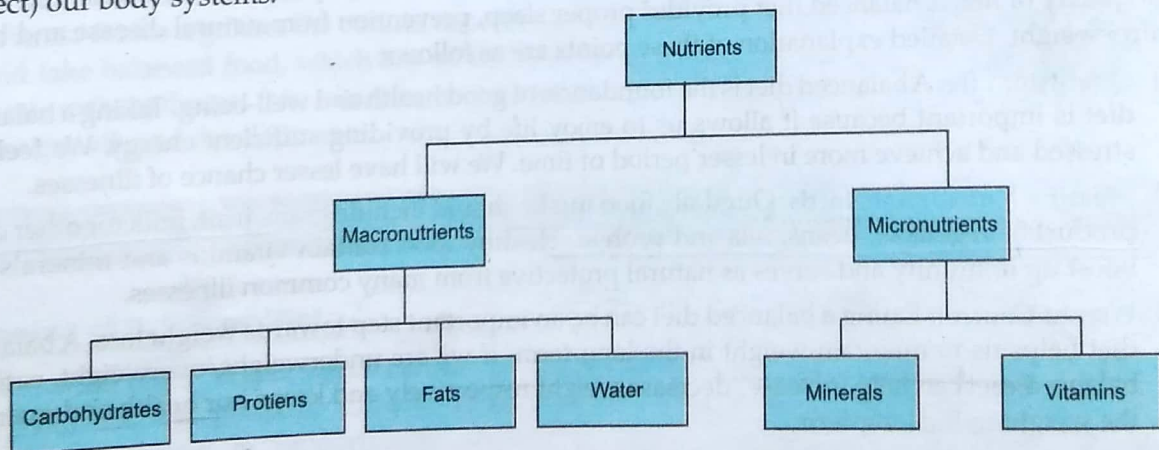
There are six major classes of nutrients: carbohydrates, fats, minerals, protein, vitamins, and water.

These nutrient classes can be categorised as either macronutrients (needed in relatively large amounts) or micronutrients (needed in smaller quantities).

The macronutrients include carbohydrates (including fiber), fats, proteins, and water. The micronutrients are minerals and vitamins.

The macronutrients (excluding fiber and water) provide structural material and energy. Some of the structural material can be used to generate energy internally, and in either case it is measured in joules or kilocalories.

Other micronutrients include antioxidants and phytochemicals, which are said to influence (or protect) our body systems.



## Macronutrients

The detailed study of macronutrients is given below:

**1. Carbohydrates:** Carbohydrates are the most important source of energy. They contain carbon, hydrogen and oxygen. The ratio between hydrogen and oxygen in carbohydrates is 2:1 as in water. These are important for different digestive functions in our body. Carbohydrates are of two types:

- (i) **Simple Carbohydrates:** These are dissolvable in water and sweet in taste. The sources of simple carbohydrates are milk, sugar, jam, etc.
- (ii) **Complex Carbohydrates:** These are indissolvable in water and not sweet in taste. The sources of complex carbohydrates are cereals, pulses, etc.

Carbohydrates act as fuel in the body and provide energy. People involved in hard work require maximum carbohydrates to produce energy in the body. Excess of carbohydrate intake may change into fats and develop fatty tissues which may lead to obesity. Lack of carbohydrates may cause loss of body weight, a wrinkle in the skin appears and individual becomes weak and thin. Carbohydrates are present in rice, potatoes, wheat, maize, barley, banana, sugarcane, ghee, butter, curd, fish oil, milk, eggs, dry fruits, coconut, soyabean, cotton-seeds, etc.



Sources of Carbohydrates

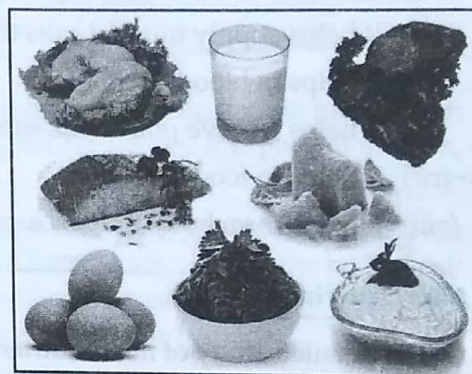
## 2. Proteins:

Proteins form very important part of our diet. Proteins contain elements like carbon, hydrogen, oxygen, nitrogen and sulphur. Proteins are large molecules and cannot mix directly into our blood. So they are broken into substances called amino-acids. Proteins are helpful for growth and development of an individual specially. Moreover, these are useful for repairing the wear and tear of tissues. Proteins help in the formation of enzymes and hormones.

Lack of proteins can cause energy deficiency in the body, anaemia, low level of immunity, loss of weight, dry skin and irritability, etc.

There are two main dietary sources of proteins:

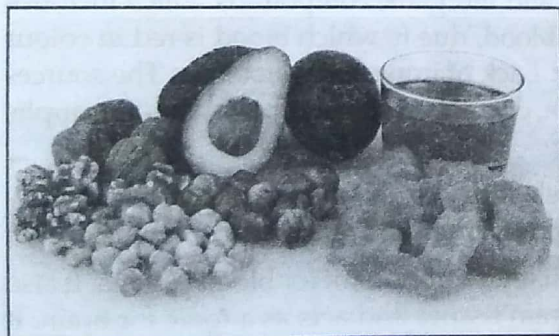
- (i) **Animal Source:** It consists of meat, fish, egg, milk, cheese, etc.
- (ii) **Plant Source:** It consists of pulses, cereals, nut, bean, peas, etc.



Sources of Protein

**3. Fats:** Fats contain carbon, hydrogen and oxygen. Fats are stored in our body as emergency source of energy. They are used after our body runs short of carbohydrate.

Fats are composed of fatty acids. They provide more calories as compared to other constituents of food. They are essential for the absorption of vitamins A, D, E and K. They are good sources of energy. Fats are derived from the following two sources:



Sources of Fats

- (i) **Animal Source:** It consists of meat and dairy products such as milk, butter, cheese and egg yolk.
- (ii) **Vegetables Source:** It consists of various edible oils of groundnut, mustard, cottonseed, sunflower and coconut.

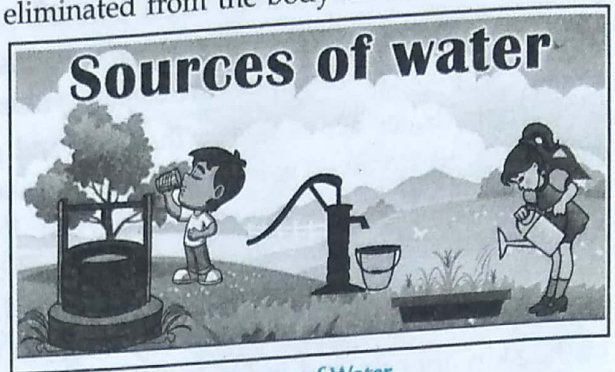
These fats and oils contain different fatty acids which are essential for human body. Fats protect the individual from injuries. It also provides energy to the nervous system.

**4. Water:** Water contains hydrogen and oxygen in the ratio 2 : 1. No one can live without water on this earth. It is

one of the most needed elements. 75% of our body contains water. Every individual may take 4 to 5 litres of water per day and the same amount may be eliminated from the body in the form of urine, perspiration and water-vapours by the lungs in the process of exhaling breath.

Our blood contains 90% of water. Water helps regulate nutrients of food in the body cells. It is also very useful for excretion of waste products from the body. It regulates the body temperature. It has various functions in the human body as given below:

- (i) It protects our bones from becoming dry and brittle.
- (ii) It helps maintain the tissues in a soft and flexible condition.
- (iii) It helps maintain the body temperature.
- (iv) It helps supply mineral salts to the body.
- (v) It helps in blood circulation.
- (vi) It helps remove poisonous substances and waste products from the body.
- (vii) It helps in food digestion.
- (viii) It helps form body fluids, *i.e.* plasma of the blood, the lymph and digestive juices.



Sources of Water

### Micronutrients

The detailed study of micronutrients is given below:

**1. Mineral and Mineral Salts:** Minerals are very important components of human diet. Minerals are necessary for the growth and development of an individual. They also help in the functioning of muscles and formation of teeth. There are various type of mineral salts:

- (i) **Calcium and Phosphorus:** Calcium and phosphorus are very important constituents of bones as well as other tissues of the body. The skeletal system is the main calcium depot. The tissue fluids, particularly plasma of the blood contain calcium. Lack of calcium in blood plasma causes increase of heart rate and muscle cramps.

Calcium provides hardness to the teeth and bones and it also helps maintain the purity of blood. It strengthens the neuro-muscular system. Lack of calcium can cause deformation in the bones. The sources of calcium are milk, orange juice, green leafy vegetable, cereals, etc.

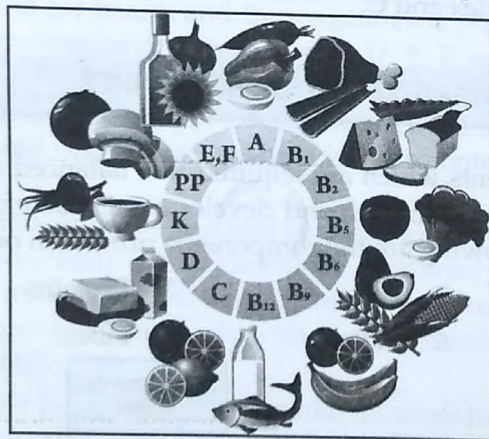
- (ii) **Iron:** Iron is found in the body in the form of organic and inorganic compounds which includes haemoglobin, myoglobin, etc. It is very important for blood, due to which blood is red in colour and helps to carry oxygen to the various parts of body. Lack of iron causes anaemia. The sources of iron are leafy vegetable, watermelon, cabbage, lettuce, cucumber, spinach, pista, almond, apple, wheat grains.

- (iii) **Magnesium:** It provides flexibility to the bones and elasticity to the muscles. It is called body refresher. It makes the teeth strong. It is present in coconut, almond, French beans, cabbage, etc.

- (iv) **Potassium:** It is required to activate enzymatic system. It is also important for blood plasma. It also helps in healing wounds. Potassium helps grow the brain tissues and acts as a tonic for brain. It is present in carrot, lettuce, onion, cucumber, tomato, mango, banana, orange, apple and coconut, etc.

- (v) **Sulphur:** It is necessary for the purification of blood and for keeping the skin in a good condition. It strengthens our brain and nervous system. The sources of sulphur are mustard, cucumber, carrot, peas, spinach, tomato, raddish, pineapple, apple, coconut, etc.
- (vi) **Fluorine:** It is good for teeth, bones and good for health. It provides enamel to the teeth. It is needed in very small quantities every day. It is present in cabbage, cauliflower, groundnut, wheat, carrot, etc.
- (vii) **Iodine:** It is required for the proper functioning of the body. It helps the thyroid gland to secrete thyroxin and regulates the body temperature. It helps to develop brain and useful for hair. Lack of iodine causes hindrance in growth. The sources of iodine are common salt (iodized), sea foods, French beans, lettuce, sea greens, etc.
- (viii) **Manganese:** It helps tone up our nervous system and coordinates the thought of the individual. It also helps in fast recovery. It provides elasticity to the muscles of the body. It is present in potato, carrot, tomato, almond, coconut, pineapple, grapes, watermelon, etc.
- (ix) **Sodium Chloride:** Sodium chloride is good for secretion of glands. It also helps in the flow of blood in the body. It helps maintain the balance of water in the body and also helps in the contraction of muscles. It is present in milk, milk products, meat, eggs, raw lady fingers, peas, orange, apple, carrot, lettuce, etc.
- (x) **Zinc:** Zinc is needed in a good quantity every day for every person. It helps in insulin preparation in pancreas. It helps produce new cells in the body. Zinc is good for nerves. It is present in bajra, wheat flour, gram leaves; mustard leaves, mutton, liver, etc.

**2. Vitamins:** They are complex compounds of carbon. There are various types of vitamins which are required in diet and they have different functions to do in the body. Vitamins are vital for the body. Lack of vitamins can cause scurvy, beriberi, rickets, pellagra, etc. An individual may need very less amount of vitamins every day and it is in milligrams. Different vitamins can be explained as below:



Types of Vitamins

- (i) **Vitamin-A:** This vitamin-A is called the vitamin of growth. It is very important for children but the lack of vitamin-A can retard the growth. It is essential for eyesight. This vitamin keeps the skin in good condition. Lack of this vitamin in children causes prickles on hands and legs. One may catch cold, cough and formation of stones in urinary tract if there is lack of vitamin-A. The sources of vitamin A are milk, egg yolk, cod-liver oil, yellow vegetables, mango, papaya etc.
- (ii) **Vitamin-B Complex:** This vitamin is very useful for heart, nerves, normal elimination, good absorptive and protective from deficiency disease. It also helps in formation of red blood corpuscles and provides stability to glands. Lack of vitamin-B complex can cause beriberi and it weakens the leg, the muscles become loose. It also helps in growth. It is present in milk, wheat, grams, cashew, nuts, peas, yeast, meat, eggs, fish, rice, bajra, maize, soyabean, mutton, kolesari dal, etc.

(iii) **Vitamin-C:** It is the most important vitamin for the growth and development of body. It activates enzymes and is useful for tissues. It is also useful for gums, keeps them healthy, heals wounds, maintains red corpuscles in blood and is good for teeth.

Lack of Vitamin-C affects the gums, can cause scurvy, swelling in joints and bleeding in skin and mucus membrane etc. It is present in turnip, papaya, leaves amla, malta, orange, lemon, green chilies, strawberry, musammi, mango and guava etc.

(iv) **Vitamin-D:** Vitamin-D helps keep the teeth and bones strong, firm and in a right shape. It also helps in the utilisation and absorption of calcium and phosphoric acid. Lack of vitamin-D causes rickets in children and bones become weaker. Vitamin-D is present in egg specially in yolk, liver of sheep, cod liver oil, shark liver oil, pure milk, etc. Natural source of vitamin-D is sunrays especially early in the morning (at sunrise time).

(v) **Vitamin-E:** It keeps the sex organs in good condition. It helps during pregnancy and helps in normal child birth. Lack of this vitamin can cause abortion. Vitamin-E is present in wheat and wheat flour, leafy vegetable, carrot, cauliflower, lettuce, cucumber, green pepper, spinach, milk, banana and butter, etc.

(vi) **Vitamin K:** This vitamin is also known as anti-bleeding vitamin. Lack of this vitamin causes inability of blood coagulation. It is present in salad leaves, cabbage, spinach, cauliflower, tomatoes, peas and carrot, etc.

Vitamins are not only formed in the body but have to be supplemented by diet too. Vitamins are of two types:

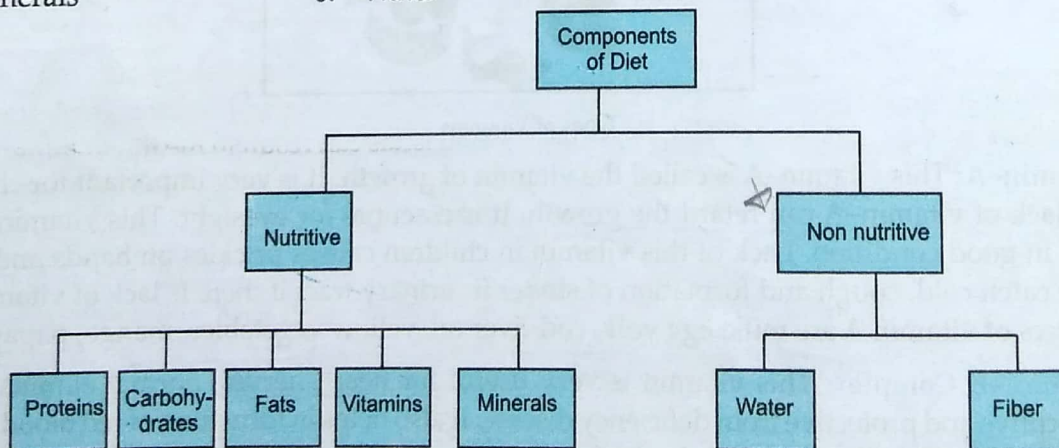
- Fat Dissolvable Vitamins:** They are stored in liver and fatty tissues. They include Vitamin A, D, E, and K.
- Water Dissolvable Vitamins:** They are needed more frequently. They are not stored in body. They include vitamin B complex and C.

## 2.2

### NUTRITIVE AND NON-NUTRITIVE COMPONENTS OF DIET

There are various components which are required in a balanced diet. Lack of any component may cause any disease and difficulty in growth and development. Therefore, all the components should be present in a balanced diet. Following are the components present in our diet:

1. Carbohydrates
2. Fats
3. Proteins
4. Vitamins
5. Minerals
6. Water
7. Fiber.



## Nutritive Components of Diet

As per the name suggests, the nutritive components include those components only whose primary function is to provide nutrition to our body. They include:

1. Carbohydrates
2. Fats
3. Vitamins
4. Proteins
5. Minerals.

Let us now discuss them briefly:

1. **Carbohydrates** are necessary to supply your body with glucose, which is its primary source of energy. They are generally divided in two categories: simple carbohydrates, which digest quickly, and complex carbohydrates, which digest slowly. Sources of simple carbohydrates include fruits, sugars and processed grains, such as white rice or flour. You can find complex carbohydrates in green or starchy vegetables, whole grains, beans and lentils. MayoClinic.com recommends around 225 grams of carbohydrates daily for healthy adults. Dietary fiber is another form of carbohydrate required for proper digestion. Women need 22 to 28 grams of fiber daily and men need 28 to 34 grams. Dietary fiber bulks your stool and keeps you feeling full for hours after a meal. Legumes, whole grains and berries are good sources of dietary fiber.
2. Despite the belief that **fats** are bad for you, they are required for general health. Fats help your body synthesise fat soluble vitamins, such as vitamin-D. Healthy fats include monounsaturated and polyunsaturated fats. Nuts, olives and avocados are sources of monounsaturated fats. Fish and seafood are primary sources of polyunsaturated fats. In addition to vegetable oils such as canola, contain both monounsaturated and polyunsaturated fats. However, certain types of fats are bad for your health, such as trans-fat and saturated fat, both of which increase your risk of heart disease. You should limit your intake of saturated fat to 16 grams daily and avoid trans-fats completely. MayoClinic.com recommends at least 44 grams of fat daily for average adults.
3. Many **vitamins** are essential for health and thus considered primary components of nutrition. Essential vitamins include vitamins A, B complex, C, D, E, K and foliate. A vitamin deficiency can cause osteoporosis, scurvy, a weakened immune system, premature aging and even certain cancers. Consuming too much of a vitamin can also result in serious toxicity, such as vitamin B-6 or vitamin A. Many fruits and vegetables have high vitamin content, as well as fortified dairy and bread products.
4. **Protein** is required for healthy muscles, skin and hair. In addition to these, it contributes to normal chemical reactions within your body. Complete sources of protein, primarily meats, contain the nine amino acids essential for human health. If you do not eat meat, combining incomplete proteins — such as rice and beans — provides your body with the nine essential amino acids. Average adults need 50 grams of protein daily.
5. **Minerals** are vital for proper human health. Essential minerals include calcium, iron, zinc, iodine and chromium. Deficiencies can result in serious health conditions such as brittle bones and poor blood oxygenation. Like vitamins, overdosing on minerals can result in life threatening conditions, for example, a potassium overdose can cause improper kidney function. Minerals are found in a variety of foods including dairy and meat products.

## Non-nutritive Components of Diet

They do not contribute or provide every one calories.

Non-nutritive dietary components include water, fiber-soluble and insoluble.

The detailed study of these components is given below.

1. **WATER:** The human body is composed of 60 per cent **water** and your brain is composed of 70 per cent of water. Water is necessary to maintain proper bodily function. Most individuals should aim



for eight to ten 8-ounce glasses of water daily. It is possible to overdose on water, and in severe cases, a water overdose can be fatal.

It has various functions in the human body, *i.e.*

- (i) It protects the bones from becoming dry and brittle.
- (ii) It helps maintain the tissues in a soft and flexible condition.
- (iii) It helps maintain the body temperature.
- (iv) It helps supply mineral salts to the body.
- (v) It helps in blood circulation.
- (vi) It helps remove poisonous substances and waste products from the body.
- (vii) It helps in food digestion.
- (viii) It helps form body fluids, *i.e.* plasma of the blood, the lymph and digestive juices.

2. **FIBERS:** can not be digested easily. It fills us up and helps keep us healthy. It is also very helpful in digestion (no constipation). It helps maintain with weight control, *e.g.* fresh fruit, vegetables and wholegrain cereals. It is generally safe to eat as much as we want and whenever we want. High-fiber foods are higher in volume and take long time to digest.

## 2.3

### EATING FOR WEIGHT CONTROL – A HEALTHY WEIGHT, THE PITFALLS OF DIETING, FOOD INTOLERANCE AND FOOD MYTHS

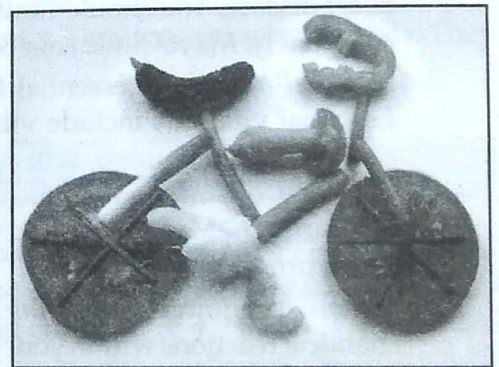
#### Eating for Weight Control – A Healthy Weight

In our eat-and-run, massive-portion-sized culture, maintaining a healthy weight can be tough. If you have tried and failed to control weight before, you may believe that diets do not work for you. You are probably right: traditional diets do not work—at least not in the long-term. However, there are plenty of small but powerful ways to avoid common dieting pitfalls, achieve lasting weight control success, and develop a healthier relationship with food. Your weight is a balancing act, but the equation is simple. If you eat more calories than you burn, you gain weight. And if you eat fewer calories than you burn, you lose weight. All too often, we make weight control much more difficult than it needs to be with extreme diets that leave us cranky and starving, unhealthy lifestyle choices that undermine our dieting efforts, and emotional eating habits that stop us before we get started. But there is a better way! You can control weight without feeling miserable. By making smart choices every day, you can develop new eating habits and preferences that will leave you feeling satisfied—and winning the battle of the bulge.

Here, we talk about the healthy weight but the healthy weight is a weight that lowers the risk for health problems. For the most people, body mass index (BMI) and waist size are good ways to tell if they are at a healthy weight. But reaching a certain number on the scale or a certain BMI, not mean that one have the healthy weight. For healthy weight, healthy eating, exercise and healthy lifestyle is very important.

#### Method to Control healthy Body Weight

While there is no “one size fits all” solution to permanent healthy weight loss, the following guidelines have a great place to start:



Healthy Diet

1. **Think change of lifestyle not short-term diet:** Permanent weight loss is not something that a “quick-fix” diet can achieve. Instead, think about weight loss as a permanent lifestyle change—a commitment to your health for life. Various popular diets can help jump start your weight loss, but permanent changes in your lifestyle and food choices are what will work in the long-run.
2. **Find a cheering section:** Social support means a lot. Programs like Jenny Craig and Weight Watchers use group support to impact weight loss and lifelong healthy eating. Seek out support—whether in the form of family, friends, or a support group—to get the encouragement you need.
3. **Slow and steady wins the race:** Aim to lose one to two pounds a week to ensure healthy weight loss. Losing weight too fast can take a toll on your mind and body, making you feel sluggish, drained, and sick. When you drop a lot of weight quickly, you are actually losing mostly water and muscle, rather than fat.
4. **Set goals to keep you motivated:** Short-term goals like wanting to fit into a dress for the summer, usually do not work as well as wanting to feel more confident or become healthier for your children’s sakes. When frustration and temptation strike, concentrate on the many benefits you will reap from being healthier and leaner.
5. **Use tools that help you track your progress:** Keep a food journal and weigh yourself regularly, keeping track of each pound and inch you lose. By keeping track of your weight loss efforts, you will see the results in black and white, which will help you stay motivated.
6. **Avoid common pitfalls:** Diets, especially fad diets or “quick-fix” pills and plans, often set you up for failure because:
  - (i) Diets that cut out entire groups of food, such as carbs or fat, are simply impractical.
  - (ii) When you drastically restrict your food intake, your metabolism will temporarily slow down. Once you start eating normally, you will gain weight until your metabolism bounces back.
  - (iii) Special shakes, meals, and programs are not only expensive, but also they are not practical for long-term weight loss.
  - (iv) Diet companies make a lot of grandiose promises, and most are simply unrealistic.
7. **Put a stop to emotional eating:** We do not always eat simply to satisfy hunger. If we did, no one would be overweight. All too often, we turn to food for comfort and stress relief. When this happens, we frequently pack on pounds.
8. **Tune in when you eat:** We live in a fast-paced world where eating has become mindless. We eat on the run, at our desk while we are working, and in front of the TV screen. The result is that we consume much more than we need, often without realising it.
9. **Fill up with fruit, veggies, and fiber:** To lose weight, you have to eat fewer calories. But that does not necessarily mean you have to eat less food. High-fiber foods are higher in volume and take longer to digest, which makes them filling. There is nothing magic about it, but the weight-loss results may seem like it. High-fiber heavyweights include fruits and vegetables, beans, whole grains. The high water and fiber content in most fresh fruits and vegetables makes them hard to overeat. You will feel full long before you have overdone it on the calories.
  - (i) Eat vegetables raw or steamed, not fried or breaded, and dress them with herbs and spices or a little olive oil or cheese for flavour.
  - (ii) Add nuts and cheese to salads but do not overdo it. Use low-fat salad dressings, such as a vinaigrette made with olive oil.



- (iii) Pour a little less cereal into your morning bowl to make room for some blueberries, strawberries, or sliced bananas. You will still enjoy a full bowl, but with a lower calorie count.
  - (iv) Swap out some of the meat and cheese in your sandwich with healthier veggie choices like lettuce, tomatoes, sprouts, cucumbers, and avocado.
  - (v) Instead of a high-calorie snack, like chips and dip, try baby carrots or celery.
  - (vi) Add more veggies to your favourite main courses to make your dish "go" further. Even dishes such as pasta and stir-fries can be diet-friendly if you use fewer noodles and more vegetables.
  - (vii) Try starting your meal with a salad or soup to help fill you up, so you eat less of your entree.
- 10. Take charge of your food environment:** Your weight loss efforts will succeed or fail based largely on your food environment. Set yourself up for success by taking charge of your food environment: when you eat, how much you eat, and what foods are available.
- (i) Consuming more of your daily calories at breakfast and fewer at dinner can help you drop more pounds. Eating a larger, healthy breakfast can jump start your metabolism, stop you feeling hungry during the day, and give you more time to burn off the calories.
  - (ii) Using smaller utensils, like a teaspoon instead of tablespoon, can slow eating and help you feel full sooner.
  - (iii) Eating on a schedule will also help you avoid eating when you are not truly hungry.
  - (iv) Cooking meals at home allows you to control both portion size and what goes into the food. Restaurant and packaged foods generally contain a lot more sodium, fat, and calories than food cooked at home.
  - (v) Create a shopping list and stick to it. Be especially careful to avoid high-calorie snack and convenience foods.
  - (vi) Limit the amount of tempting foods you have at home. If you share a kitchen with non-dieters, store snack foods and other high-calorie indulgences in cabinets or drawers out of your sight.
  - (vii) Try to eat your last meal earlier in the day and then fast until breakfast the next morning.
- 11. Make healthy lifestyle changes:** You can support your dieting efforts by making healthy lifestyle choices.
- (i) Exercise is a dieter's best friend. It not only burns calories, but also can improve your resting metabolism.
  - (ii) You actually burn less calories watching television than you do sleeping.
  - (iii) Reduce your daily calorie intake by replacing soda, alcohol, or coffee with water. Thirst can also be confused with hunger, so by drinking water, you may avoid consuming extra calories.

Keep in mind it may take some experimenting to find the right diet for your individual body. It is important that you feel satisfied so that you can stick with it on a long-term basis. If one diet plan does not work, then try another one. There are many ways to lose weight. The key is to find what works for you.

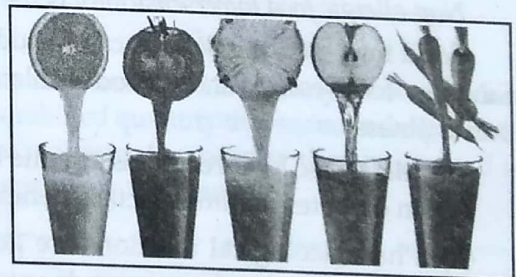
### The Pitfalls of Dieting

We all know losing weight is not as simple as it sounds. Eat less food and exercise more to create a calorie shortfall — we all know the science but how comes the execution is never quite as straight forward. Pitfalls of dieting are as follows:

- 1. Restriction for some specific things:** Many diets ask you to severely limit a major nutrient. One diet says to cut out the carbohydrates, another tells you to limit your protein, and still others tout that fat-free is the way to go.

**Here is the truth—Your body needs all forms of nutrients:** You were made to consume all the nutrients found in the major food sources on the Earth. Go too long restricting one and you are bound to find your body taking over in the form of increasing cravings or impaired functioning. Understand what kinds of nutrients are the highest quality and how much of each you need and you are on the road to regaining your health.

2. **Dieting is the only way to lose weight:** For starters, stop thinking about dieting. Instead, take a look at those everyday habits that could be causing weight gain. Going on a diet can create an obsession with food, heighten cravings, and lead to a “throw-in-the-towel-because-diets-don’t-work” mentality.
3. **Eating habits:** You might not realise just how quickly calories can add up. Eating while cooking, starting each day with a high-calorie coffee drink, finishing off the kids’ plates at dinner, or having one too many glasses of wine — these are just a few of the sneaky habits that sabotage weight loss efforts.
4. **Racing to the Finish:** “We need to adopt more of the leisurely, European-style eating so that we can savor our food, taste every bite, and get the signal of fullness before overeating,” says Tara Gidus.
5. **Skipping Meals:** Research shows that breakfast skippers weigh more than breakfast eaters. There is a misconception that skipping breakfast — or any meal — saves calories. The truth is that most people who eat fewer than three meals usually end up eating *more* calories during the course of the day. Strive for three meals a day. Always start your day with a healthy breakfast, but be careful to choose wisely. A healthy breakfast should contain both protein and fiber. An egg, a piece of whole-wheat toast, and half a grapefruit has only 250 calories and will keep you feeling full until lunch.
6. **Too Many Liquid Calories:** Liquid calories from alcohol, smoothies, coffee with cream and sugar, sweetened juices, teas, and sodas can really contribute to weight gain. “When you drink beverages, you do not tend to compensate by eating less because most beverages satisfy thirst and do not impact hunger,” says Gidus. Switch from calorie-laden beverages to water, club soda, skim milk, vegetable juices, and small portions of 100% fruit juice. If you drink alcohol, do so in moderation, and choose lighter drink options.
7. **Mindless Eating:** “Eating amnesia” is the act of unknowingly putting hand to mouth, usually from a bag or box in front of the television, while reading a book. It can also happen at happy hour, or when you finish the last few bites on your child’s plate. “Resist the temptation to clean yours or anyone else’s plate,” says Gidus. “Think about your waistline instead of the food waste.”
8. **Not getting enough protein:** Protein helps one to feel more alert. Therefore, if you are eating a morning breakfast with very little protein, you may end up feeling sluggish and be more prone to snacking. You don’t need a lot of protein either: Try adding peanut butter to your toast in the morning or a few walnuts to your cereal or even a boiled egg at your snack. You will feel more satisfied and be able to go longer without eating.
9. **Eating Too Few Calories:** Our body has systems from fighting against starvation and some diets are so restrictive they do just that. When we undereat our body goes into ‘starvation mode’, causing our metabolism to drop and for our bodies to hold on to more calories out of fear that food is not widely available. Also eating the same number of calories daily can have the same affect. That is why it is a good idea to have a reward meal once per week to prevent this. A reward meal should not turn into a reward week though.



- 10. Not Exercising:** If you don't live an active lifestyle, losing weight will be an uphill battle. Exercise has a huge impact on body metabolism and also helps burn some extra calories off. You do not have to hit the gym on a regular basis to be fit. Try walking, biking, playing with your kids...anything that gets you moving. Every little bit make a difference!

### ★ Food Intolerance

Food intolerance or non-allergic food hypersensitivity is a term used widely for varied physiological responses associated with a particular food, or compound found in a range of foods.

Food intolerance is a detrimental reaction, often delayed, to a food, beverage, food additive, or compound found in foods that produces symptoms in one or more body organs and systems, but it is not a true food allergy. A true food allergy requires the presence of immune mechanisms, against the food.

Food intolerances can be classified according to their mechanism. Intolerance can result from the absence of specific chemicals or enzymes needed to digest a food substance, as in hereditary fructose intolerance. It may be a result of an abnormality in the body's ability to absorb nutrients. Food intolerance reactions can occur to naturally occurring chemicals in foods. Drugs sourced from plants, such as aspirin, can also cause these kinds of reactions.



Food Intolerance

### Definitions of Food Intolerance

*Non-allergic food hypersensitivity* is the medical name for food intolerance.

Food intolerance reactions can include pharmacologic, metabolic, and gastro-intestinal responses to foods or food compounds. Food intolerance does not include either psychological responses or food borne illness.

- (i) Metabolic food reactions are due to inborn or acquired errors of metabolism of nutrients, such as in diabetes mellitus, lactase deficiency, phenylketonuria and favism.
- (ii) Pharmacological reactions are generally due to low-molecular-weight chemicals which occur either as natural compounds, such as salicylates and amines, or due to food additives, such as preservatives, coloring, emulsifiers and taste enhancers. These chemicals are capable of causing drug-like (biochemical) side effects in susceptible individuals.
- (iii) Gastro-intestinal reactions can be due to malabsorption or other Gastrointestinal Tract abnormalities.
- (iv) Immunological responses are mediated by non-IgE immunoglobulin, where the immune system recognises a particular food as a foreign body.
- (v) Toxins may either be present naturally in food, be released by bacteria, or be due to contamination of food products. Toxic food reactions are caused by the direct action of a food or substance without immune involvement.
- (vi) Psychological reactions involve manifestation of clinical symptoms caused not by food but by emotions associated with food. These symptoms do not occur when the food is given in an unrecognisable form.

Elimination diets are useful to assist in the diagnosis of food intolerance. There are specific diagnostic tests for certain food intolerances.

## Signs and Symptoms of Food Intolerance

Symptoms of food intolerance vary greatly, and can be mistaken for the symptoms of a food allergy. While true allergies are associated with fast-acting immunoglobulin IgE responses, it can be difficult to determine the offending food causing food intolerance because the response generally takes place over a prolonged period of time. Thus, the causative agent and the response are separated in time, and may not be obviously related. Food intolerance symptoms usually begin about half an hour after eating or drinking the food in question, but sometimes symptoms may delay up to 48 hours.

Food intolerance can present with symptoms affecting the skin, respiratory tract, gastrointestinal tract (GIT) either individually or in combination. On the skin may include skin rashes, urticaria (hives), angioedema, dermatitis, and eczema. Respiratory tract symptoms can include nasal congestion, sinusitis, pharyngeal irritations, asthma and an unproductive cough. GIT symptoms include mouth ulcers, abdominal cramp, nausea, gas, intermittent diarrhoea, constipation, irritable bowel syndrome.

## Causes of Food Intolerance

- (a) Reactions to chemical components of the diet are more common in food allergies. They are caused by various organic chemicals occurring naturally in a wide variety of foods, both of animal and vegetable origin more often than to food additives, preservatives, colorings and flavorings, such as sulfites or dyes. Both natural and artificial ingredients may cause adverse reactions in sensitive people if consumed in sufficient amount, the degree of sensitivity varying between individuals.
- (b) Pharmacological responses to naturally occurring compounds in food, or chemical intolerance, can occur in individuals from both allergic and non-allergic family backgrounds. Symptoms may begin at any age, and may develop quickly or slowly.
- (c) A deficiency in digestive enzymes can also cause some types of food intolerances.
- (d) The patient may be sensitive to multiple food chemicals and reaction more likely to occur when foods containing the triggering substance are eaten in a combined quantity that exceeds the patient's sensitivity thresholds. People with food sensitivities have different sensitivity thresholds, and so more sensitive people will react to much smaller amounts of the substance.

## Prevention of Food Intolerance

There is an emerging evidence from the studies of cord bloods that both sensitisation and the acquisition of tolerance can begin in pregnancy, however, the window of main danger for sensitisation to foods extends prenatally, remaining most critical during early infancy when the immune system and intestinal tract are still maturing. There is no conclusive evidence to support the restriction of dairy intake in the maternal diet during pregnancy in order to prevent. This is generally not recommended since the drawbacks in terms of loss of nutrition can outweigh the benefits. However, further randomised, controlled trials are required to examine if dietary exclusion by lactating mothers can truly minimise risk to a significant degree and if any reduction in risk is outweighed by deleterious impacts on maternal nutrition.

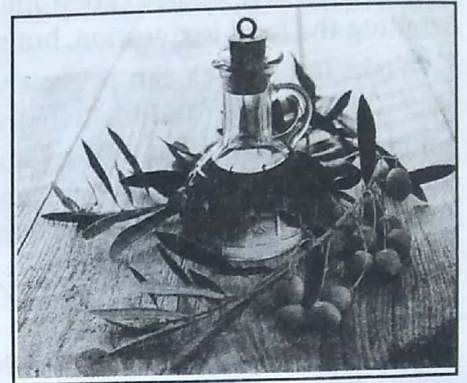
A Cochrane review has concluded feeding with a soy formula cannot be recommended for prevention of allergy or food intolerance in infants. Further research may be warranted to determine the role of soy formulas for prevention of allergy or food intolerance in infants unable to be breast fed with a strong family history of allergy or cow's milk protein intolerance. In the case of allergy and celiac disease others recommend a dietary regimen is effective in the prevention of allergic diseases in high-risk infants, particularly in early infancy regarding food allergy and eczema. The most effective dietary regimen is exclusively breastfeeding for at least 4–6 months or, in absence of breast milk, formulas with documented reduced allergenicity for at least the first four months, combined with avoidance of solid food and cow's milk for the first four months.

## Food Myths

Many of the popular concepts promoted for healthy living are at best inaccurate and often untrue. Many people just believe everything they hear or read, but in actual one should ask questions and research the topic if one really wants to get to the truth.

Here are some of the food myths listed below:

- 1. Drink at Least Eight Glasses of Water a Day:** Eight glasses of water a day was a good rule of thumb. The need for water should be assessed according to level of activity and outside temperatures. If urine is dark rather than slightly coloured or clear, people should drink more water.
- 2. Olive Oil is Healthier than Canola, Sunflower or Vegetable Oil:** The phenolics in olive oil appear to possess free-radical scavenging properties that reduce damage to DNA which may protect against breast, colon, lung, ovarian and skin cancer. Beneficial effects on blood pressure, obesity, rheumatoid arthritis and immune function have also been cited. Meanwhile, canola, sunflower and vegetable oils are all largely unsaturated and linked to "good" fats such as omega-3 and omega-6. But whatever the fat, it should only be consumed in small quantities.
- 3. Fresh Vegetables are more Nutritious than Frozen:** Fresh food, particularly when eaten in season is great, but frozen and canned foods are good alternatives — equally nutritious, and convenient. However, those boiled in large amounts of water for a long time lose nutrients as they are leached into the water. Steaming will retain more vitamins and minerals.
- 4. Vitamin C will Ward off Colds:** The link between vitamin C and cold prevention remains unproved. People who take vitamin C supplements will still catch colds, however the evidence shows that symptoms may be milder and their duration slightly reduced.
- 5. Chocolate causes Acne:** There is no evidence to date that chocolate can cause pimples. However, recent research suggests that high-glycogenic foods, combined with a high intake of refined carbohydrates, biscuits, cakes and lollies, may.
- 6. Milk increases Mucus Production:** Drinking milk can make mucus feel thicker, but there is a little evidence that it produces more mucus.
- 7. Dark Chocolate is Better than Milk Chocolate:** Several studies around the world report the flavonoids found in cocoa beans can lower blood pressure and cholesterol. Dark chocolate contains more cocoa, whereas milk and white chocolate contain fewer flavonoids because they have less cocoa. But the National Heart Foundation does not recommend dark chocolate consumption to prevent or treat heart disease. Along with the Dietitians' Association of Australia, it warns that commercial chocolate — dark, milk or white — contains high levels of sugar and saturated fat.
- 8. Avoiding Foods after 7 PM will Help You Lose Weight:** What really counts with weight loss is the balance of kilojoules consumed and burned throughout the day from the moment you wake

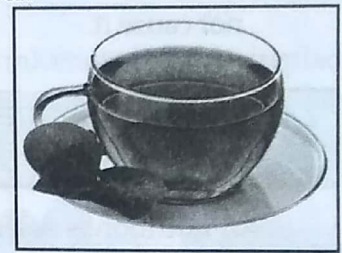


to when you turn in — if you eat more than you burn, you will gain weight. Nutritionists report that the time of day or the type of food you are eating only has a bearing when you have exceeded your recommended daily intake of kilojoules.

9. **Margarine is Healthier than Butter:** Butter's biggest problem is its level of saturated fat which raises LDL, the so-called bad cholesterol, and increases our risk of cardiovascular disease. Replacing butter with margarine lowers the intake of saturated fats and replaces them with polyunsaturated fats. Switching to margarine will remove almost three kilos of saturated fat from your diet in a year.



10. **Drinking Tea is Better for You than Coffee:** There is a positive link between tea consumption and cardiovascular health, citing a reduced risk of heart disease, stroke and even a reduction in belly fat. Daily consumption of just three or more cups could lower risk of stroke by up to 21 per cent while coffee contains anti-oxidants that may protect hearts.



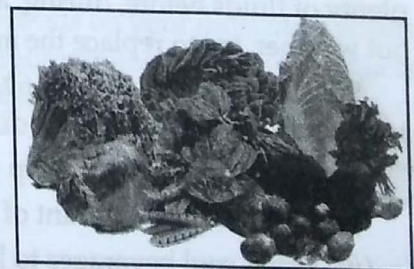
11. **Carbohydrates should not be eaten with Protein:** There are plenty of diets based on the belief that the digestive system can not tackle a combination of foods or nutrients. The opposite is often true. Foods eaten together can help the digestive system. For example, vitamin C in orange juice can increase iron absorption from a meal rich in plant-based iron such as beans, rice, lentils and other legumes. Very few foods are purely carbohydrate or purely protein; most are a mixture of both.

12. **Too Much Dairy will Make You Fat:** Eating dairy products is not associated with weight gain. However, since full-cream dairy products are quite high in fat. Two to three serves of low-fat milk, yoghurt and cheese daily and considers them a good source of calcium, for strong bones and teeth, protein and vitamins A, D and B<sub>2</sub>.

13. **Certain Foods can Burn Fat:** Grapefruit, green tea, chilly and kelp are said to speed up the metabolism and burn off body fat. But there is no scientific evidence that proves this. Dietary fiber comes closest, providing a feeling of fullness with minimal kilojoules.

14. **Low-fat Products are Better for You:** Some low-fat foods were also highly processed and contained harmful levels of sugar and additives, used in adding taste. Consumers should always consider low-fat alternatives, but reading labels was crucial in keeping sugar levels down.

15. **Dark Green Vegetables are Better for You:** High in calcium, iron, magnesium, potassium, phosphorous, zinc and vitamins A, C, E and K, leafy greens have been associated with lowering the risk of certain cancers, and while there is no conclusive evidence they are better for you than other vegetables, there is no doubt they are a healthy addition to most diets.



16. **Eggs can Elevate Cholesterol Levels:** Egg yolks contain a significant amount of cholesterol. The cholesterol in eggs has an insignificant effect on blood cholesterol levels, especially when compared to saturated and trans-fats. Good quality protein and omega-3 oils, vitamins and minerals far outweigh any effect their cholesterol content may have.

17. **Whole Fruits are Healthier than Fruit Juices:** Eating more whole fruits, particularly blueberries, grapes and apples, is associated with a lower risk of type 2 diabetes, while greater fruit juice consumption has an adverse effect.

18. **Organically grown Foods are Better for You:** Organic foods are no more nutritious than non-organic varieties that is, they do not contain higher levels of vitamins and minerals. The term



“organic” refers to the method of production and the way ingredients are grown. It is suggested organic foods may reduce exposure to pesticide residue and antibiotic-resistant bacteria, though its impact is unclear.

19. **Brown Sugar is Better than White Sugar:** While both contain a smidge of essential minerals, they contribute nothing to our diet. Brown sugar is white sugar with added molasses — a black syrup by-product of sugar refining. Light brown sugar contains about three per cent molasses, dark brown about six.
20. **Eating too much Sugar Causes Type 2 Diabetes:** Poor diet, not getting enough exercise, and carrying too much weight commonly explain much of the risk associated with diabetes. Eating or drinking too much sugar can result in weight gain, which increases the risk of diabetes, but does not cause it.

## 2.4

### SPORTS NUTRITION AND ITS EFFECT ON PERFORMANCE (FLUID AND MEAL INTAKE, PRE, DURING AND POST COMPETITION)

Sport nutrition is essentially the study of the science behind food and how it can benefit or impair sporting performance and fitness. It is concerned with the type and quantity of fluid and food taken by an athlete, and deals with nutrients such as vitamins, minerals, supplements and organic substances such as carbohydrates, proteins and fats.

Athletes who want a winning edge need the right nutrition. When you give your body the right fuel prior to training, after training and during competitions by drinking enough water and eating a balanced diet, you will make the most of your athletic talents and gain more strength, power, and endurance as they can have effects on their body composition and ultimately performance and recovery.



#### Hydration (Fluid Intake)

Water is the most important nutrient for athletes. To stay hydrated and avoid overheating, drink plenty of fluids before, during, and after sports or exercise. When you work out or compete, especially in hot weather, try to replace the amount of water you lose in sweat by drinking the same amount of fluid.

Sports drinks made up of 6% to 10% carbohydrates can help you stay hydrated during longer events. Most sports drinks should be diluted with approximately 50% water.

The following tips will help you stay hydrated:

- (i) Drink a small amount of water frequently rather than a large amount less often.
- (ii) Drink cool beverages to lower your core body temperature and reduce sweating.
- (iii) Track your sweat loss by weighing yourself both before and after exercise. For every pound lost through sweat, drink 16 to 24 oz. of water. Your body weight should be back to normal before your next workout.
- (iv) Pay attention to the amount and colour of your urine. A large volume of clear urine is a sign that you are well-hydrated. Smaller amounts or dark yellow urine can indicate dehydration.

You cannot depend on feeling thirsty to know when your body needs water. By the time you notice that you are thirsty, you have lost about 1% of your body weight. A 2% loss of body weight in fluid can actually decrease your performance by 10 to 15%.

During extreme conditions, your intake should increase even more, because your body is working harder. A less expensive alternative is to dilute any fruit juice by about half with water. Try drinking your fluid when it is cool, but not too cold – it will leave the stomach more quickly and get into your system at this temperature.

### Fluid Schedule Before, During and After Exercise

- (i) Drink about 1-2 cups (250–500 ml) of fluid before 4 or less hours of exercise. Water is usually the best choice at this time.
- (ii) Drink about a half or one and half a cup (125–375 ml) of fluid before 2 or less hours of exercise. Water is usually the best choice at this time.
- (iii) Keep fluid with you when you exercise. Sip it during your workout. Drink enough fluid to replace water lost through sweat. Water is usually your best choice. Sports drinks are a good choice when exercising for over 1 hour.
- (iv) If you drank enough fluid during your exercise let your thirst guide you over the rest of the day, *i.e.* after exercise. Eat your regular meals and healthy snacks over the day. Water continues to be a good choice but you can also include milk or chocolate milk, 100% fruit juice and sports drinks some fluids may cause stomach upset and cause your performance to suffer. **Fluids to AVOID during exercise are:**



- (a) Carbonated soft drinks, regular fruit juice, fruit drinks, lemonade.
- (b) Energy drinks that contain a lot of sugar or caffeine.

### Fuel Sources (Meal Intake)

A balanced diet is another key to sports nutrition. Eating the right combination of fuel from carbohydrates, proteins, and fats will give you energy for top performance.

#### Before Exercise

The size and timing of a meal or snack before an intense workout depends on your individual needs. Approximately 2–4 hours before an event try to eat a meal high in carbohydrates (*e.g.* grain products, fruits and vegetables), relatively low in protein (small servings of choices such as chicken, beans, or humus), and fibre and low in fat. This may help to:

- (i) boost up energy levels
- (ii) prevent hunger
- (iii) keep you hydrated
- (iv) extend your time to exhaustion

Some people experience an upset stomach if they eat a meal before activity. A liquid snack such as a sports drink or smoothie is a good alternative. Carbohydrate-rich snack examples include some sport bars, fruit, and cereal with milk, lentils, bagels, pasta, yogurt, and homemade granola bars. “Carbohydrate-loading” (for competitive activities that last longer than 90 minutes) has been found to build extra carbohydrate energy stores in the body (as muscle and liver glycogen). However, it may not offer additional benefits to performance if you follow a high-carbohydrate diet or eat a carbohydrate rich snack before and/or during exercise.

### During Exercise

During intense exercise that lasts longer than one hour, eating carbohydrate might help extend time to exhaustion and may improve performance in some activities such as sprints and agility drills. Approximately 30–70 g of carbohydrates per hour (such as in the form of a sports drink), in small amounts every 15 to 20 minutes, can improve exercise performance. For activities lasting longer than an hour or in extreme heat, sports drinks provide hydration as well as carbohydrate.

### After Exercise

Once your activity is finished, your body is ready to store energy, repair muscles and fill the body with fluids again. Carbohydrate eaten within 30 minutes of exercise and again every two hours for four to six hours will replenish glycogen stores. Meals or snacks should also contain protein for building and repairing muscle and fluids for rehydrating. Immediately after exercise, good choices would be a smoothie (blend milk, fruit and ice together), sport drink, chocolate milk and water. Soon after exercise choose a meal or snack rich in carbohydrate and protein. For example:

- (i) chicken or fish with brown rice and tender-crisp steamed vegetables
- (ii) pasta and meat sauce with a leafy green salad
- (iii) vegetarian chilli with a whole grain roll.

### Sports Nutrition (Fluid and Meal Intake, Pre, During and Post-competition)

Balanced diet definitely affects the performance in sports competition.

Sports Activity	Diet Before Competition	Diet During Competition	Diet After Competition
Endurance activities like players of marathon, basketball, football, hockey, cyclist, cricket	More amount of complex carbohydrates like rice, potato, wheat, bread, banana, date, gram, sugar, nuts, pulses, bajra	Simple carbohydrates and sufficient water if required (after 1 hour) like, fruit juice, glucose, water	Lots of complex carbohydrates of low fats sufficient water like rice, potato, wheat, bread, chocolate, cake, biscuits, pulses, cereals, etc.
Skill activities or speed activities like players of sprint races, kho-2, water polo, skating, swimming	More amount of carbohydrates—simple and complex	Simple carbohydrates in liquid form if required	Sufficient amount of complex carbohydrates, lots of vitamins and minerals, increased amount proteins
Explosive activities and body contact activities like players of wrestling, kabaddi, judo, jump, throws	More amount of carbohydrates—simple and complex	Simple carbohydrates in liquid form if required	Sufficient amount of complex carbohydrates, lot of proteins, lots of vitamins and minerals

## 2.5

### FOOD SUPPLEMENT FOR CHILDREN

Nowadays most of the parents remain under stress and tension about their children's unhealthy lifestyle. We are well aware of the fact that fast foods have become the favourite foods of the majority of the children. On the other hand, highly nutritious foods are rarely found in the list of children. This trend may lead to the growth and development problems. The main reason may be the lack of proper nutrition.

Parents have found the solution of this problem in the form of food supplements. So it is essential for all of us to know about food supplements.

Food supplements can add missing nutrients to the diet or can augment those you consume in whole foods. One can take them for a variety of reasons. For example, to help reach fitness or health goal, to cope with an aversion to a particular nutrient rich food or simply as insurance that you receive adequate overall nutrition. Food supplements can include products that add protein, vitamins and minerals or calories to your diet, and all these offer advantages and disadvantages.

Parents should also be aware that many complementary health products, including food supplements and herbal medicines, have not been tested for safety or effectiveness in children. Because children's metabolism and their immune, digestive and central nervous systems are still maturing, side effects can differ from those seen in adults. This is especially true for infants and young children.

### Type of food supplements

Food supplements generally include vitamins, minerals, fibre, fatty acids or amino acids, among other substances. These supplements may be in the form of a tablet or powder which can be added to water or milk for consumption. Food supplements are of the following types according to the nutrient it provides:

1. **Protein Supplements:** protein is a macronutrient one need to consume each day to support growth, tissue maintenance and immune health. Protein supplements are available as powders, shakes or bars. Protein supplements can add an unnecessary expense to the budget because whole food can give all the protein one need.
2. **Vitamins and Minerals Supplements:** vitamins and minerals support a wide variety of functions in the body, and the amount one needs vary depending on the age and health status. Supplements can help in maintaining the optimal health if the dietary intake is low, whether because one is on a calorie restricted diet or because one doesn't like eating particular foods containing a specific nutrient.
3. **Calorie Supplements:** supplements that supply a combination of protein, carbohydrates and healthy fats can add both nutrients and calories to help combat weight loss during recovery from any disease. Picky eaters, rapidly growing children or extreme athletes might also benefit from high calorie supplements. However, in the absence of any one of these conditions, consuming this type of food supplement, may merely add extraneous calories to your diet, resulting in accumulation of excess body fat.
4. **Fibre Supplements:** Fibrous supplements are available in many forms and allow people to increase the amount of fibres in their diets if they aren't eating or getting enough from food.

### Advantages of food supplements

1. Protein supplements are rich in branched chain amino acids, which can speed muscle recovery after an intense workout.
2. Calorie supplements help in maintaining weight during appetite loss in cancer.
3. Calorie supplements helps in recovery by maintaining proper weight.
4. Fibrous supplements help in short-term relief from constipation and bowel irregularities.
5. Dietary fibre supplements helps in weight management as it helps people feel fuller longer.
6. Food supplements helps prevent deficiency diseases,
7. Vitamins and minerals supplements help make immune system stronger.
8. Food supplements helps in proper growth of growing children.
9. Food supplements provide instant energy to the body.

### Disadvantages of food supplements

1. Consuming more nutrients than the body can use adds extra calorie to the diet and may wind up with gaining unwanted weight.
2. Excess of vitamin supplements can cause liver abnormalities.
3. Excess intake of supplements during pregnancy can cause birth defects.
4. Overconsumption of minerals supplements can causes toxicity.
5. Excess of iron, magnesium, selenium or zinc supplements can cause digestive problems.
6. High level of calcium can cause kidney stone formation.
7. High manganese intake can lead to neurotoxicity.
8. Food supplements can cause allergy and intolerance among children.
9. Regular usage of food supplements can cause faintness, dizziness, deafness or nausea.

## IMPORTANT QUESTIONS

### Very Short Answer Type Questions

1. Define balanced diet? (2012)
2. Mention the factors on which diet of an individual depends?
3. What is nutrition?
4. Name all the nutrients?
5. What are the macronutrients?
6. What are the micronutrients? (All India, 2016)
7. Mention the sources of carbohydrates?
8. Write down the main function of carbohydrates?
9. What are proteins? (2012)
10. What are amino-acids?
11. Mention the sources of proteins?
12. Write down the main function of proteins?
13. Why does the weight-lifters diet include lots of protein? (C.B.S.E. Sample paper, 2015)
14. Which nutrient is also called as emergency source of energy?
15. Mention the sources of fats?
16. Write down the main function of fats?
17. Explain the importance of calcium for children? (2012)
18. Enlist any two sources for calcium and iron separately? (Delhi, 2015)
19. What is responsible for red colour of blood?
20. Name the diseases caused due to deficiency of iron?
21. What acts as tonic to brain?
22. What provides enamel to the teeth?
23. Name the main sources of:
 

(a) Vitamin A	(b) Vitamin B	(c) Vitamin C	(d) Vitamin D
(e) Vitamin E	(f) Vitamin K		