

## UNIT - I

### BASICS OF NUTRITION

#### LONG ANSWER QUESTIONS

*Q. Write about the Importance of good nutrition.*

*Ans:*

1. Eating a poor diet reduces physical and mental health because eating healthy allows people to be more active. Feelings of well being can be protected by ensuring that our diet is full of essential fats, carbohydrates, enough protein , vitamins and minerals. Eating clean and nutrient rich food is more important than eating caloric dense and less nutrient. It also gives you energy.

2. *It's expensive to be unhealthy:* This pointer does not require much explanation as we all know eating royale always can welcome many dangerous diseases. It's ok to eat and treat yourselves with your most favorite food once in a while because food is divine and divine energy should always be followed. Please note that eating healthy is not boring. Instead, healthy can turn out to be more interesting and your favorite too with little twists in the method of preparation.

3. *Improves skin health and delays aging :* yes the lustrous skin is the result of a proper balanced nutritional diet and your physical regimen too. Good nutrition does not just affect your weight or your energy. It can also play a role in the health of your skin. According to the American Academy of Dermatology, foods that contain vitamin C, E, lycopene and other antioxidants, can help to protect your skin against sun damage.

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❖ Iodine: Enlarged thyroid glands (goiters), decreased production of thyroid hormone, growth and development issues. Since undernutrition leads to serious physical issues and health problems, it can increase your risk of death. In fact, it's estimated that stunting, wasting and zinc and vitamin A deficiencies.

Overnutrition: The main signs of overnutrition are overweight and obesity, but it can also lead to nutrient deficiencies. Research shows that people who are overweight or obese are more likely to have inadequate intakes and low blood levels of certain vitamins and minerals compared to those who are at a normal weight. One study in 285 adolescents found that blood levels of vitamins A and E in obese people were 2–10% lower than those of normal-weight participants. This is likely because overweight and obesity can result from an overconsumption of fast and processed foods that are high in calories and fat but low in other nutrients. A study in over 17,000 adults and children found that those who ate fast food had significantly lower intakes of vitamins A and C and higher calorie, fat and sodium consumption than those who abstained from this type of food.

### 3. What is a balanced diet? Explain it.

Ans: A balanced diet comprises foods from all the major food groups in the right proportions to provide the body with ideal nutrition.

#### Importance of well-balanced diet:

A well-balanced diet helps with sustained weight control. Calorie requirements depend on age, physical activity level, and a weight goals. An appropriately balanced diet includes low-calorie, nutrient-dense foods such as whole grains, lean protein, fruits and vegetables. Here are the key benefits of consuming a well-balanced diet:

- ❖ Growth and Development
- ❖ Maintains weight
- ❖ Improved Energy levels, Lowers Risk of Illness

decline in life expectancy. Diets that are rich in nutrients and do not contain processed foods have been found to have a positive effect on life expectancy.

## **2. Define nutrition. Write about malnutrition.**

**Ans:** Nutrition is defined as the process of taking food to carry out different functions of the body needed for the survival of the organisms.

**Malnutrition:** Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. Malnutrition includes undernutrition and overnutrition, both of which can lead to health problems and nutrient deficiencies if not addressed.

**Signs and Symptoms:** The signs and symptoms of malnutrition depend on the type issues related to under- or overnutrition.

**Undernutrition:** Undernutrition typically results from not getting enough nutrients in your diet. This can cause: Weight loss, Loss of fat and muscle mass, Hollow cheeks and sunken eyes, Swollen stomach, Dry hair and skin, Delayed wound healing, Fatigue, Difficulty concentrating, Irritability, Depression and anxiety.

People with undernutrition may have one or several of these symptoms. Kwashiorkor, a severe protein deficiency, causes fluid retention and a protruding abdomen. On the other hand, the condition marasmus, which results from severe calorie deficiency, leads to wasting and significant fat and muscle loss. Undernutrition can also result in micronutrient deficiencies. Some of the most common deficiencies and their symptoms include

- ❖ **Vitamin A:** Dry eyes, night blindness, increased risk of infection
- ❖ **Zinc:** Loss of appetite, stunted growth, delayed healing of wounds, hair loss, diarrhea
- ❖ **Iron:** Impaired brain function, issues with regulating body temperature, stomach problems

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**4. Boosts immune system:** When you practice good nutrition you are consuming natural and healthy foods that can help your body. This includes improving your immune system. Our immune system is our defense against diseases but poor nutrition is the most common cause of immune deficiencies worldwide. The choices you make when you eat don't just affect one part of your body. Its one of the best ways to improve your health and your quality of life that is important. A healthy diet also prevents one from malnutrition. Hence a balanced diet is very important to outweigh the adverse effects of malnutrition.

**5. Helps you manage a healthy weight:** Eating a nutritious diet filled with fruits, vegetables, whole grains, dairy and protein but in balanced form help maintain a healthy body weight. Healthy diet and exercise program aids in maintaining a healthy weight. If eating healthy makes you think about the food you can not have, refocus your thoughts on the foods you can have. Put a new spin on an old recipe to make it a little healthier. You don't have to give up your favorite comfort foods, its all about balance.

**6. Healthy eating positively affects your mood:** As much as food affects our mood, mood affects our food choices. When we experience feelings of sadness, we are more likely to choose unhealthy foods and vice versa. Therefore a positive re-engineering can be developed by following a healthy body and mind which will eventually help to control our emotional differences at times.

**7. Increases Focus:** Food has an impact on the way we think. When the body is low on glucose, the brain is not receiving the energy it needs to remain focused. Diets high in fat and cholesterol can seriously damage the brain by building up plaque in brain vessels damaging brain tissue and causing strokes.

**8. Longevity:** Your body needs food in order to survive, but the process of breaking down food nutrients or metabolizing, causes stress on the body. Overeating creates more stress on the body and could lead to a shorter lifespan. Obesity could potentially lead to

- ❖ Decreases depression and anxiety
- ❖ Micronutrients-vitamins and minerals are important to boost immunity and development.
- ❖ Protects you from non-communicable diseases such as obesity, diabetes, cardiovascular disease, and some types of cancer.

#### ***Components of a balanced diet:***

**1. Carbohydrates:** A vital source of energy, carbohydrates comprise about 60% of an individual's diet. Most of your energy needs are met from carbohydrates. Choose wisely from complex carbohydrate sources such as whole grains-wheat, millets, brown rice etc.

**2. Protein:** Protein is needed to assist your body to repair cells and make new ones. It is also essential for growth and development during the various stages of life. About 25% of daily calories should come from protein found in pulses like- moong dal, urad dhal and legumes like-kidney beans (rajma), black-eyed beans (lobia), and chickpeas (channa). Milk and milk products like -paneer, curd, and yoghurt are also a great source of protein. For the non-vegetarians, good sources include eggs, fish and lean meat.

**3. Fats:** Fats contribute to about 15% of daily caloric needs and are a major energy source. They are also vital for storing and providing vitamins and synthesizing hormones. Some of the good sources of fats for one's daily diet can come from polyunsaturated fats such as flax seeds, sunflower seed etc., monounsaturated fats such as olive oil, sesame oil etc., and saturated fats such as butter, and ghee -however, remember to use these in moderation.

**4. Vitamins and Minerals:** Micronutrients - vitamins and minerals support metabolism, nerve and muscle function, bone maintenance and cell production. Fruits and vegetables are the major sources of vitamins and minerals including potassium, iron, folate, vitamin A and vitamin c.

**5. Water:** Life without water is unimaginable. A major nutritional component that helps regulate body temperature, lubricate

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your joints and protects your major organs, and tissues. Water aids to transport oxygen throughout your body. Make sure that you drink at least 8 glasses of water every day.

A balanced diet supplies the human body with essential nutrients that your body needs to work effectively. If you are having an unbalanced diet, the system is prone to disease, infection, fatigue and poor performance. Children who are deprived of healthy foods may face growth and developmental issues, poor academic performance and highly prone to persistent infections.

Group	Particulars	Body	Net Energy	Protein g/d	Visible Fat g/day	Calcium mg/d	Iron
Man	Sedentary work	2320		25			
	Moderate work	60	2730	60	30	600	17
	Heavy work		3490		40		
Woman	Sedentary work	1900		20			
	Moderate work	2230		25		600	21
	Heavy work		2850		30		
	Pregnant woman	55	+350	82.2	30	1200	35
	Lactation 0-6 months		+600	77.9	30		
	6-12 months		+520	70.2	30	1200	25

### 4. Give an account of Dietary sources of Carbohydrates

**Ans:** Most dietary carbohydrates come from plants. Sugars are utilized by the body, primarily to generate energy. Although dietary fiber is also a carbohydrate, it contributes no calories because it is not digested or absorbed.

**I. Potatoes, Rice and Pasta:** Potatoes, rice and pasta uniformly contain high levels of carbohydrates in the form of starch. A 1-c

serving of boiled white potatoes contains 31 grams of carbohydrates and a cup of mashed potatoes provides approximately 36 grams. A small order of fast-food French fries contains 32 grams of carbs and a large order contains 63 grams. Brown and white rice and pasta made from refined flour each contain approximately 41 to 46 grams of carbohydrates per cooked cup. Whole-wheat pasta is a healthy alternative to refined-flour pasta; it contains more fiber and fewer carbohydrates, with 37 grams per cooked cup.

**2. Cereals:** Cereals can add a significant amount of carbs to the human diet. Grains contribute starchy carbs and added sugar can substantially increase the total carbohydrate content. Puffed wheat and rice are among the lowest carbohydrate cereals with 10 to 13 grams per cup. Oat squares are in the middle range with approximately 33 grams per cup. Granola and other cereals with dried fruit or nuts typically contain 47 to 67 grams of carbohydrates per cup.

**3. Starchy Vegetables and Beans:** Beans and starchy vegetables, such as potatoes, yams, green peas, water chestnuts and corn, contain high levels of complex carbohydrates that your body digests into sugars. In addition, starchy vegetables and beans contribute vitamins, minerals and fiber to your diet. Dry beans also serve as a good source of lean dietary protein.

**4. Fruit:** All fruit and fruit juices contain carbohydrates in the form of natural sugars, such as glucose and fructose. Fruit sugars contribute nearly all of the calories contained in these foods. Fresh fruit is a healthier option than fruit juice because it provides more dietary fiber and less carbohydrates by volume. For example, a cup of apple juice contains 29 grams of carbohydrates and 0.2 gram of fiber compared to 14 grams of carbohydrates and 1.4 grams of fiber in a cup of fresh apples.

**5. Beverages:** Dairy milk is the only significant source of dietary carbohydrates not derived from plants. A cup of unflavored milk contains about 11 to 12 grams of carbohydrate in the form of

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milk sugar, or lactose. Chocolate milk contains more than twice the amount of carbohydrate per cup compared to plain milk because sugar is added to sweeten the flavor. Sugar-sweetened soda, fruit drinks and sports and energy drinks substantially contribute to dietary sources of carbohydrate. Dessert wines typically contain roughly four times the amount of carbohydrates found in table wines.

**6. Sweets and Added Sugar:** Eating candy and desserts markedly boosts the number of carbohydrates in the diet. Indulging in a 1.6-ounce milk chocolate bar adds more than 26 grams of carbohydrates to daily intake; a slice of cherry pie adds approximately 47 to 69 grams. Sugar added to processed foods that you may not consider sweet can be an unrecognized source of carbohydrates in your diet. Commercial pasta sauces, salad dressings, sandwich bread, energy and nutrition bars, cereals, heat-and-eat meals and other convenience foods commonly contain high-fructose corn syrup or another form of sugar for added flavor. Opting for whole, fresh foods rather than processed foods helps us to avoid hidden carbohydrates.

**7. Sugar-Sweetened Drinks:** Regular soda, sports drinks, energy beverages and flavored waters contain high levels of carbohydrates and are the leading source of added sugar. A 12-ounce can of regular soda contains 35 to 46 grams of carbohydrates. Sugar-sweetened sports drinks typically contain 24 to 29 grams of carbohydrates per 12-ounce serving, and energy drinks contain 39 to 46 grams. A comparable serving of flavored, vitamin-fortified water contains 19 to 20 grams of carbohydrates.

**8. Baked Goods:** Bread, rolls and sweet baked goods rank among the highest carbohydrate foods. The carbohydrates in breads and rolls come primarily from grain flour, which contains high levels of starch, a form of carbohydrate that breaks down into sugars in the digestive tract.

**5. What are the dietary sources of fats and its importance?**

**Ans:** Dietary fat refers to the fats and oils found naturally in animal and plant foods, and those used in cooking, at the table, and added to processed foods. Dietary fat is made up of fatty acids. There are two main types of fatty acids: saturated and unsaturated.

Unsaturated fats: These are liquid at room temperature, are considered beneficial fats because they can improve blood cholesterol levels, ease inflammation, stabilize heart rhythms, and play a number of other beneficial roles. Unsaturated fats are predominantly found in foods from plants, such as vegetable oils, nuts, and seeds. There are two types of "good" unsaturated fats:

1. Monounsaturated fats are found in high concentrations in: Olive, peanut, and canola oils, Avocados, Nuts such as almonds, hazelnuts, and pecans, Seeds such as pumpkin and sesame seeds
2. Polyunsaturated fats are found in high concentrations in: Sunflower, corn, soybean, and flaxseed oils, Walnuts, Flax seeds, Fish, Canola oil – though higher in, monounsaturated fat, it's also a good source of polyunsaturated fat. Omega-3 fats are an important type of polyunsaturated fat. The body can't make these, so they must come from food.

**Saturated Fats:** All foods containing fat have a mix of specific types of fats. Even healthy foods like chicken and nuts have small amounts of saturated fat, though much less than the amounts found in beef, cheese, and ice cream. Saturated fat is mainly found in animal foods, but a few plant foods are also high in saturated fats, such as coconut, coconut oil, palm oil, and palm kernel oil. Other sources include

- ❖ Pizza and cheese
- ❖ Whole and reduced fat milk, butter and dairy desserts
- ❖ Meat products (sausage, bacon, beef, hamburgers)
- ❖ Cookies and other grain-based desserts

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- ❖ A variety of mixed fast food dishes

**Trans Fats:** Trans fatty acids, more commonly called trans fats, are made by heating liquid vegetable oils in the presence of hydrogen gas and a catalyst, a process called hydrogenation.

- ❖ Partially hydrogenating vegetable oils makes them more stable and less likely to become rancid. This process also converts the oil into a solid, which makes them function as margarine or shortening.
- ❖ Partially hydrogenated oils can withstand repeated heating without breaking down, making them ideal for frying fast foods.
- ❖ For these reasons, partially hydrogenated oils became a mainstay in restaurants and the food industry – for frying, baked goods, and processed snack foods and margarine.

Partially hydrogenated oil is not the only source of trans fats in our diets. Trans fats are also naturally found in beef fat and dairy fat in small amounts. Trans fats are the worst type of fat for the heart, blood vessels, and rest of the body because they:

- ❖ Raise bad LDL and lower good HDL
- ❖ Create inflammation – a reaction related to immunity – which has been implicated in heart disease, stroke, diabetes, and other chronic conditions
- ❖ Contribute to insulin resistance
- ❖ Can have harmful health effects even in small amounts – for each additional 2 percent of calories from trans fat consumed daily, the risk of coronary heart disease increases by 23 percent.

### **Importance of Fats:**

Our body needs dietary fat for many biological processes. You wouldn't be able to live a healthy life without it. Here are some of the essential roles dietary fat plays in your body:

- ❖ Helps you absorb vitamins: Vitamins A, D, E and K are fat-soluble, meaning your body can absorb them only when you consume them along with fat. A lack of fat in your diet can

cause deficiencies in these vitamins, which can lead to a variety of health issues.

- ❖ Supports cell growth: Fat provides structure to the outer membrane of every cell in your body.
- ❖ Supports brain and eye health: The omega-3 fatty acids eicosatetraenoic acid(EPA) and docosahexaenoic acid(DHA) help maintain the health of your brain, central nervous system, and retinas. Your body doesn't make these fatty acids — you can only get them from your diet.
- ❖ Wound healing: Essential fatty acids play a key role in wound healing and blood clotting.
- ❖ Hormone production: Your body needs dietary fat in order to make specific hormones, including the sex hormones testosterone and estrogen.
- ❖ Source of energy: Each gram of fat you consume provides you with about 9 calories of energy. For comparison, each gram of carbohydrate or protein yields only 4 calories of energy.

#### ***Effects of Deficiency of Lipids:***

Dietary fat deficiency is rare in healthy people who eat a balanced, nutritious diet. However, some conditions observed include: Eating disorders, Large bowel resection, inflammatory bowel disease, Cystic fibrosis, Pancreatic insufficiency, low fat diet.

#### ***6. Write about the sources of proteins, functions and their deficiency effects?***

**Ans:** Protein is one of three macronutrients, which are nutrients the body needs in larger amounts. Protein is made up of long chains of amino acids. There are 20 amino acids. The specific order of amino acids determines the structure and function of each protein. The 20 amino acids that the body uses to create protein are: alanine, arginine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine

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histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine.

There are nine essential amino acids that the human body does not synthesize, so they must come from the diet. Proteins may be either complete or incomplete. Complete proteins are proteins that contain all essential amino acids. Animal products, soy, and Quinoa are complete proteins. Incomplete proteins are proteins that do not contain all essential amino acids. Most plant foods are incomplete proteins, including beans, nuts, and grains.

Protein is present in every body cell, and an adequate protein intake is important for keeping the muscles, bones, and tissues healthy. Protein plays a role in many bodily processes, including blood clotting, fluid balance, immune system responses, vision, hormones, enzymes. Protein is important for growth and development, especially during childhood, adolescence, and pregnancy.

**Sources of protein:** A healthful eating pattern includes a variety of foods containing protein. Both animal and plant foods can be excellent sources of protein. Ex: seafood, lean meats and poultry, eggs, legumes, which include beans and peas, nuts, seeds, soy products

Dairy products, such as milk, cheese, and yogurt, also contain protein. Whole grains and vegetables contain some protein, but generally less than other sources. Animal products tend to contain higher amounts of protein than plant foods. A person does not need to consume foods containing all the essential amino acids at each meal because their body can use amino acids from recent meals to form complete proteins. Eating a variety of protein foods throughout the day is the best way for a person to meet their daily protein needs.

The FDA (Food and Drug Administration) recommends that adults consume 50 grams (g) of protein a day, as part of a 2,000 calorie diet. A person's daily value may be higher or lower depending on their calorie intake. FDA provide the following recommended daily amounts (RDA) for protein by sex and age group: Protein is a source of calories. Generally, protein and carbohydrates contain 4 calories per gram. Fats contain 9 calories per gram.

<i>Age</i>	<i>Protein RDA</i>
child aged 1–3	13 g
child aged 4–8	19 g
child aged 9–13	34 g
female teen aged 14–18	46 g
male teen aged 14–18	52 g
female adult aged 19+	46 g
male adult aged 19+	56 g

### *Protein deficiency:*

Protein deficiency can lead to malnutrition, such as kwashiorkor and marasmus, which can be life threatening. Protein deficiency can arise if a person has a health condition, including:

- ❖ an eating disorder, such as anorexia nervosa
- ❖ certain genetic conditions
- ❖ advanced stages of cancer
- ❖ difficulty absorbing nutrients due to a health issue such as irritable bowel syndrome or gastric bypass surgery.

### *Very low protein intake can lead to:*

- ❖ weak muscle tone
- ❖ edema or swelling due to fluid retention
- ❖ thin, brittle hair
- ❖ skin lesions
- ❖ in adults, a loss of muscle mass
- ❖ in children, growth deficits
- ❖ hormone imbalances

Building and repairing muscle requires protein. Many athletes and bodybuilders use protein products to boost muscle growth. A wide range of protein supplements is currently available, many claiming to encourage weight loss and increase muscle mass and strength

**7. Write a brief account of Vitamins- functions, food sources.**

**Ans: Water-soluble vitamins:** Water-soluble vitamins travel freely through the body, and excess amounts usually are excreted by the kidneys. The body needs water-soluble vitamins in frequent, small doses. These vitamins are not as likely as fat-soluble vitamins to reach toxic levels. But niacin, vitamin B6, folate, choline, and vitamin C have upper consumption limits. Vitamin B6 at high levels over a long period of time has been shown to cause irreversible nerve damage.

A balanced diet usually provides enough of these vitamins. People older than 50 and some vegetarians may need to use supplements to get enough B12.

<b>Nutrient</b>	<b>Function</b>	<b>Sources</b>
<u>Thiamine</u> <u>(vitamin B1)</u>	Part of an enzyme needed for energy <u>metabolism</u> ; important to <u>nerve function</u> , lack of	Found in all nutritious foods in moderate amounts: pork, <u>whole grain foods</u> or enriched breads and cereals, legumes, nuts and seeds
<u>Riboflavin</u> <u>(Vitamin B<sub>2</sub>)</u>	Appetite, and causes beriberi Part of an enzyme needed for energy <u>metabolism</u> ; cataract develop in the eye, and skin diseases, shedding of hair and inflammation in tongue,	Milk and milk products; leafy green vegetables; whole grain foods, enriched breads and cereals

<u>Niacin</u> <u>(vitamin B3)</u>	Part of an enzyme needed for energy metabolism; causes <u>Pellagra</u> , important for <u>nervous system</u> , <u>digestive system</u> , and <u>skin health</u>	<u>Meat, poultry, fish, whole grain foods, enriched breads and cereals, vegetables (especially mushrooms, asparagus, and leafy green vegetables), peanut butter</u>
<u>Pantothenic acid</u>	Part of an enzyme needed for energy metabolism	<u>Widespread in foods</u>
<u>Biotin</u>	<u>Deficiency leads to Scurvy.</u> Swollen bleeding gums, Part of an enzyme needed for energy metabolism	Widespread in foods; also produced in the intestinal tract by bacteria, <u>eggs, liver, milk, peas.</u> <u>Cauliflower, dried beans</u>
<u>Pyridoxine</u> <u>(vitamin B6)</u>	Part of an enzyme needed for protein metabolism; helps make red blood cells, its deficiency shows retarded growth, anemia, irritability, vomiting and Diarrhoea	<u>Meat, fish, poultry, vegetables, fruits, egg yolk</u>
<u>Folic acid</u>	Part of an enzyme needed for making DNA and new red blood cells	<u>Leafy green vegetables and legumes, seeds, orange juice, and liver;</u> now added to most refined grains
<u>Cobalamin</u> <u>(vitamin B12)</u>	Part of an enzyme needed for making new cells; important to nerve function, its deficiency causes pernicious anaemia.	<u>Meat, poultry, fish, seafood, eggs, milk and milk products; not found in plant foods</u>

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<u>Ascorbic acid (vitamin C)</u>	<u>Antioxidant; part of an enzyme needed for protein metabolism; important for immune system health; aids in iron absorption. Its deficiency causes scurvy,</u>	<u>Found only in fruits and vegetables, especially citrus fruits, vegetables in the cabbage family, cantaloupe, strawberries, tomatoes, lettuce, papayas, mangoes, kiwifruit</u>
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**Fat-soluble vitamins:**

Fat-soluble vitamins are stored in the body's cells and are not excreted as easily as water-soluble vitamins. They do not need to be consumed as often as water-soluble vitamins, although adequate amounts are needed. If you take too much of a fat-soluble vitamin, it could become toxic.

A balanced diet usually provides enough fat-soluble vitamins. You may find it more difficult to get enough vitamin D from food alone and may consider taking a vitamin D supplement or a multivitamin with vitamin D in it.

<u>Nutrient</u>	<u>Function</u>	<u>Sources</u>
Vitamin A (and its precursor*, beta-carotene)*A precursor is converted by the body to the vitamin.	Needed for vision, healthy skin and mucous membranes, bone and tooth growth, immune system health	Vitamin A from animal sources (retinol): fortified milk, cheese, cream, butter, fortified margarine, eggs, liver. Beta-carotene, Leafy, dark green vegetables; dark orange fruits, and vegetables (carrots, winter squash, sweet potatoes, pumpkin).
Vitamin D	Needed for proper absorption of	Egg yolks, liver, fatty fish, fortified milk, fortified margarine. When exposed to

	<u>calcium, stored in bones</u>	<u>sunlight, the skin can make vitamin D.</u>
Vitamin E	<u>Antioxidant; protects cell walls</u>	<u>Polyunsaturated plant oils (soybean, corn, cottonseed, safflower); leafy green vegetables; wheat germ; whole-grain products; liver; egg yolks; nuts and seeds</u>
Vitamin K	<u>Needed for proper blood clotting</u>	<u>Leafy green vegetables such as kale, collard greens, and spinach; green vegetables such as broccoli, Brussels sprouts, and asparagus; also produced in intestinal tract by bacteria</u>

### 8. Write about the SOURCES OF Calcium.

**Ans:** Calcium is very important for your health. It makes up much of your bones and teeth and plays a role in heart health, muscle function and nerve signaling.

The recommended daily intake (RDI) of calcium is 1,000 mg per day for most adults, though women over 50 and everyone over 70 should get 1,200 mg per day, while children aged 4–18 are advised to consume 1,300 mg.

The main foods rich in calcium are dairy products like milk, cheese and yogurt, seafood, leafy greens, legumes, dried fruit; tofu and various foods that are fortified with calcium.

**1. Seeds:** Seeds are tiny nutritional powerhouses. Some are high in calcium, including poppy, sesame, celery and chia seeds. Ex: 1 tablespoon (9 grams) of poppy seeds pack 126 mg of calcium, or 13% of the RDI. Seeds also deliver protein and healthy fats. Ex.: chia seeds are rich in plant-based omega- 3 fatty acids. Sesame seeds have 9% of the RDI for calcium in 1 tablespoon (9 grams), plus other minerals, including copper, iron and manganese.



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**2. Cheese:** Most cheeses are excellent sources of calcium. Parmesan cheese has the most, with 331 mg - or 33% of the RDI- per ounce (28 grams). As an added bonus, your body absorbs the calcium in dairy products more easily than that from plant sources.

**3. Yogurt:** Yogurt is an excellent source of calcium. Many types of yogurt are also rich in live probiotic bacteria, which have various health benefits. One cup (245 grams) of plain yogurt contains 30% of the RDI for calcium, as well as phosphorus, potassium and vitamins B2 and B12. Low-fat yogurt may be even higher in calcium, with 45% of the RDI in one cup (245 grams).

While Greek yogurt is a great way to get extra protein in your diet, it delivers less calcium than regular yogurt

**4. Beans and Lentils:** They are high in fibre, protein and micronutrients. They also boast lots of iron, zinc, folate, magnesium and potassium. However, winged beans top the chart — a single cup (172 grams) of cooked wing beans has 244 mg, or 24% of the RDI for calcium . White beans are also a good source, with one cup (179 grams) of cooked white beans providing 13% of the RDI.

**5. Almonds:** Of all nuts, almonds are among the highest in calcium — one ounce of almonds, or about 22 nuts, delivers 8% of the RDI. Almonds also provide 3 grams of fiber per ounce (28 grams), as well as healthy fats and protein. In addition, they're an excellent source of magnesium, manganese and vitamin E. Eating nuts may help lower blood pressure, body fat and other risk factors for metabolic disease.

**6. Whey Protein:** Whey protein is found in milk. It's an excellent protein source and full of quickly digested amino acids. Whey is also exceptionally rich in calcium — a 1-ounce (28-gram) scoop of whey protein powder isolate contains 200 mg, or 20% of the RDI. Whey protein is an exceptionally healthy protein source and one scoop of whey protein powder has 20% of the RDI for calcium.

**7. Some Leafy Greens:** Dark leafy greens are incredibly healthy, and some of them are high in calcium. Greens that have good

amounts of this mineral include collard greens, spinach and Kale. Some dark, leafy greens are rich in calcium. One cup (190 grams) of cooked collard greens packs 25% of your daily needs. However, some leafy greens contain oxalates, which make some calcium unavailable to your body.

**8. Rhubarb :** Rhubarb has a lot of fiber, vitamin K, calcium and smaller amounts of other vitamins and minerals. It contains prebiotic fibre, which can promote healthy bacteria in your gut . Like spinach, rhubarb is high in oxalates, so much of the calcium is not absorbed.

**9. Fortified Foods:** However, keep in mind that your body can't absorb all that calcium at once, and it's best to spread your intake throughout the day. Flour and cornmeal may also be fortified with calcium. This is why some breads, tortillas and crackers contain high amounts.

#### **9. Write about the Sources of potassium.**

**Ans:** Many of the foods that you already eat contain potassium. The foods listed below are high in potassium.

##### **a) Many fresh fruits and vegetables are rich in potassium:**

Bananas, oranges, cantaloupe, honeydew, apricots, grapefruit (some dried fruits, such as prunes, raisins, and dates, are also high in potassium), Cooked spinach, Cooked broccoli, Potatoes, Sweet potatoes, Mushrooms, Peas, cucumbers, Zucchini, Pumpkins, Leafy greens.

##### **b) Juice from potassium-rich fruit is also a good choice:**

Orange juice, Tomato juice, Prune juice, Apricot juice, Grapefruit juice

**c) Certain dairy products,** such as milk and yogurt, are high in potassium (low-fat or fat-free is best).

**d) Some fish contain potassium:** Tuna, Halibut, Cod, Trout, Rockfish

e. **Beans or legumes that are high in potassium include:** Lima beans, Pinto beans, Kidney beans, Soybeans, Lentils

f) **Other foods that are rich in potassium include:**

Salt substitutes (read labels to check potassium levels), Molasses, Nuts, Meat and poultry, Brown and wild rice, Bran cereal, Whole-wheat bread and pasta.

1. **Avocados:** They are also a particularly great source of vitamin K and folate. One half of an avocado (100 grams) contains 487 mg of potassium, or 10% of the AI. If you eat a whole avocado, you'd get 20% of your daily potassium needs at once. Avocados may help people with high blood pressure, who are often told to increase their potassium and reduce their salt (sodium) intake

2. **Sweet Potatoes:** sweet potatoes have become increasingly popular and are often used as an alternative to potatoes. They're an especially nutritious way of supporting your potassium intake — one medium-sized sweet potato contains 541 mg or 12% of your potassium AI. Sweet potatoes are low in fat, pack a small amount of protein and are a good source of complex carbohydrates and fibre. They're also an excellent source of vitamin A, as one sweet potato provides over 400% of your RDI..

3. **Spinach:** Spinach is one of the most nutrient dense leafy vegetables around. One cup (156 grams) of frozen spinach contains 540 mg of potassium, or roughly 12% of the AI. It also packs a punch with other nutrients. The same serving size contains 366% of your RDI for vitamin A, 725% for vitamin K, 57% for folate and 29% for magnesium. Similarly, about three cups (100 gms of raw spinach contain 558 mg of potassium, also around 12% of the AI.

4. **Watermelon:** It is a large, delicious fruit with a high water content. Just two wedges of watermelon (about 1/8 of a melon or 572 grams) will give you 640 mg of potassium, just under 14% of the AI. The same serving size also contains 172 calories, 44 grams of carbohydrates, 3.4 grams of protein, 0.8 grams of fat and 2.2 grams of fiber. Red melon is a great source of vitamins A and C, as well as magnesium.

**5. Coconut Water:** It is a fantastic, hydrating drink. It's an excellent natural alternative to sports drinks, as it contains key electrolytes that help draw water into your cells, and its natural sugars provide energy during exercise or replenish lost glycogen stores after. One cup (240 ml) of coconut water contains 600 mg or about 13% of the AI for potassium. Plus, it's a good source of magnesium, calcium, sodium and manganese. It's refreshing when served chilled with ice after a sweaty workout.

**10. What are Macro and micro minerals? What are its functions and effects of deficiency.**

**Ans:** Minerals are specific kinds of nutrients that your body needs in order to function properly. A mineral deficiency occurs when your body doesn't obtain or absorb the required amount of a mineral. The human body requires different amounts of each mineral to stay healthy. They can be obtained from food, mineral supplements, and food products that have been fortified with extra minerals.

A deficiency often happens slowly over time and can be caused by a number of reasons. An increased need for the mineral, lack of the mineral in the diet, or difficulty absorbing the mineral from food are some of the more common reasons. Mineral deficiencies can lead to a variety of health problems, such as weak bones, fatigue, or a decreased immune system.

There are five main categories of mineral deficiency: calcium, iron, magnesium, potassium, and zinc.

**Calcium deficiency:** Calcium is needed for strong bones and teeth. It also supports proper function of your blood vessels, muscles, nerves, and hormones. Lack of calcium over the long term can lead to decreased bone mineral density called osteopenia. If left untreated, osteopenia can turn to osteoporosis. This increases the risk of bone fractures, especially in older adults. Severe calcium deficiency is usually caused by medical problems or treatments, such as medications (like diuretics), surgery to remove the stomach, or kidney

failure. Symptoms of a severe deficiency include: cramping of the muscles, numbness, tingling in the fingers, fatigue, poor appetite, irregular heart rhythms.

**Iron deficiency:** More than half of the iron in your body is in red blood cells. Iron is an important part of hemoglobin, a protein that carries oxygen to your tissues. Iron is also a part of other proteins and enzymes that keep your body healthy. Iron deficiency develops slowly and can cause anemia. The symptoms of iron-deficiency anemia include feeling weak and tired. You may be performing poorly at work or school. Children may exhibit signs through slow social and cognitive development.

**Magnesium deficiency:** The body needs magnesium for hundreds of chemical reactions. These include responses that control blood glucose levels and blood pressure. Proper function of muscles and nerves, brain function, energy metabolism, and protein production are also controlled by magnesium. Roughly 60 percent of the body's magnesium resides in the bones while nearly 40 percent resides in muscle and soft tissue cells.

Magnesium deficiency is uncommon in healthy people. The kidneys can keep magnesium from leaving the body through the urine. Still, certain medications and chronic health conditions like alcoholism may cause magnesium deficiency. Early signs of magnesium deficiency include: fatigue, weakness, loss of appetite, nausea and vomiting. Magnesium deficiency can lead to the following symptoms if left untreated: numbness, tingling, muscle cramps, seizures, abnormal rhythms of the heart.

**Potassium deficiency:** Potassium is a mineral that functions as an electrolyte. It's required for muscle contraction, proper heart function, and the transmission of nerve signals. It's also needed by a few enzymes, including one that helps your body turn carbohydrates into energy.

The most common cause of potassium deficiency is excessive fluid loss. Examples can include extended vomiting, kidney disease,

or the use of certain medications such as diuretics. Symptoms of potassium deficiency include muscle cramping and weakness. Other symptoms show up as constipation, bloating, or abdominal pain caused by paralysis of the intestines. Severe potassium deficiency can cause paralysis of the muscles or irregular heart rhythms that may lead to death.

**Zinc deficiency:** Zinc plays a role in many aspects of the body's metabolism. These include: protein synthesis, immune system function, wound healing, DNA synthesis.

It's also important for proper growth and development during pregnancy, childhood, and adolescence. Zinc deficiency can cause loss of appetite, taste, or smell. Decreased function of the immune system and slowed growth are other symptoms.

**Sodium deficiency:** Common symptoms of low blood sodium include: weakness, fatigue, or low energy headache, nausea, vomiting, muscle cramps or spasms, confusion and irritability.

**Causes of low sodium include:** Severe vomiting or diarrhoea, taking certain medications, including antidepressants and pain medications, Taking diuretics (water pills), drinking too much water during exercise (this is very rare), dehydration, Kidney disease or kidney failure, Liver disease, heart problems, adrenal gland disorders, such as addison's disease, which affects your adrenal gland's ability to regulate the balance of sodium, potassium, and water in your body, hypothyroidism (underactive thyroid), primary polydipsia, a condition in which excess thirst makes you drink too much using ecstasy Diabetes insipidus, a rare condition in which the body doesn't make antidiuretic hormone

### 11. Write about the Sources of sodium.

**Ans:** Table salt, known chemically as sodium chloride, is made up of 40% sodium. It's estimated that at least half of people with hypertension have blood pressure that's affected by sodium

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consumption - meaning they're salt sensitive. In addition, your risk for salt sensitivity increases with age. The Reference Daily Intake (RDI) for sodium is 2,300 mg — or about 1 teaspoon of salt. Sodium is added to foods for flavor and as part of some food preservatives and additives.

**1. Shrimp:** Packaged, plain, frozen shrimp commonly contains added salt for flavor, as well as sodium-rich preservatives. For example, sodium tripolyphosphate is commonly added to help minimize moisture loss during thawing. A 3-ounce (85-gram) serving of non breaded frozen shrimp may contain as much as 800 mg of sodium, 35% of the RDI. Breaded, fried shrimp is similarly salty. In contrast, a 3-ounce (85-gram) serving of fresh-caught shrimp without salt and additives has just 101 mg of sodium, or 4% of the RDI.

**2. Soup:** Canned, packaged, and restaurant-prepared soups often pack a lot of sodium, though you can find reduced-sodium options for some canned varieties. The sodium primarily comes from salt, though some soups also contain sodium-rich flavor additives, such as monosodium glutamate (MSG). On average, canned soup has 700 mg of sodium, or 30% of the RDI, per 1-cup (245-gram) serving.

**3. Ham:** Ham is high in sodium because salt is used to cure and flavor the meat. A 3-ounce (85-gram) serving of roasted ham averages 1,117 mg of sodium, or 48% of the RDI.

**4. Instant pudding:** Pudding doesn't taste salty, but there's plenty of sodium hiding in the instant pudding mix. This sodium is from salt and sodium-containing additives disodium phosphate and tetrasodium pyrophosphate used to help thicken instant pudding. A 25-gram portion of instant vanilla pudding mix — used to make a 1/2-cup serving — has 350 mg of sodium, or 15% of the RDI.

**5. Cottage cheese:** It is a good source of calcium and an excellent source of protein, but it's also relatively high in salt. A 1/2-cup (113-gram) serving of cottage cheese averages 350 mg of sodium, or 15% of the RDI. The salt in cottage cheese not only enhances flavor

but also contributes to texture and functions as a preservative. Therefore, you generally won't find low-sodium versions.

**6. Vegetable juice:** An 8-ounce (240-mL) serving of vegetable juice may have 405 mg of sodium, or 17% of the RDI. Fortunately, some brands offer low-sodium versions, which means they can have no more than 140 mg of sodium per serving according to FDA rules.

**7. Pizza:** Pizza and other multi-ingredient dishes account for almost half of the sodium Americans consume. Many of the ingredients, such as cheese, sauce, dough, and processed meat, contain significant amounts of sodium, which add up quickly when they're combined. A large, 140-gram slice of store-bought, frozen pizza averages 765 mg of sodium, or 33% of the RDI. A restaurant-prepared slice of the same size packs even more — averaging 957 mg of sodium, or 41% of the RDI.

**8. Sandwiches:** Sandwiches are another one of the multi-ingredient dishes that account for almost half of the sodium Americans consume. The bread, processed meat, cheese, and condiments often used to make sandwiches all contribute a significant amount of sodium.

**9. Canned vegetables:** Canned vegetables are convenient but pack their share of sodium. For example, a 1/2-cup (124-gram) serving of canned peas has 310 mg of sodium, or 13% of the RDI. Similarly, a 1/2-cup (122-gram) serving of canned asparagus pack 346 mg of sodium, or 15% of the RDI. Draining and rinsing canned vegetables for a couple of minutes can reduce sodium content by 9–23%, depending on the vegetable. Alternatively, opt for plain, frozen vegetables, which are low in sodium yet convenient.

**10. Pickles:** A single 1-ounce (28-gram) dill pickle spear - the kind of pickle that might come alongside a deli sandwich - has about 241 mg of sodium, or 10% of the RDI. The sodium in whole pickles adds up more quickly. A medium-sized dill pickle packs 561 mg of sodium, or 24% of the RDI. If you're on a sodium-restricted diet, keep pickle portions small.

**11. Sauces:** You may flavor foods with sauces either during cooking or at the table, but some of that flavor comes from salt. Soy sauce is among the saltiest — a 1-tablespoon (15-ml) serving packs 1,024 mg of sodium, or 44% of the RDI. Barbecue sauce is quite salty as well, with 2 tablespoons (30 ml) providing 395 mg of sodium, or 17% of the RDI.

**12. Tomato sauce:** You may not think to check the sodium in a can of plain tomato sauce or other canned tomato products, but you should. Just 1/4 cup (62 grams) of tomato sauce has 321 mg of sodium, or 14% of the RDI. Fortunately, canned tomato products without added salt are widely available.

### **12. Write about the Sources of Iron:**

**Ans:** Iron is a mineral that serves several important functions, its main one being to carry oxygen throughout your body as a part of red blood cells. It's an essential nutrient, meaning you must get it from food. The Daily Value (DV) is 18 mg. Iron deficiency can cause anemia and lead to symptoms like fatigue. Menstruating women who don't consume iron-rich foods are at a particularly high risk of deficiency.

**1. Shellfish:** Shellfish is tasty and nutritious. All shellfish is high in iron, but clams, oysters, and mussels are particularly good sources. For instance, a 3.5-ounce (100-gram) serving of clams may contain up to 3 mg of iron, which is 17% of the DV. A 3.5-ounce serving of clams also provides 26 grams of protein, 24% of the DV for vitamin C, and a whopping 4,125% of the DV for vitamin B12. Shellfish is also rich in many other nutrients and may increase HDL (good) cholesterol levels in your blood.

**2. Spinach:** spinach provides many health benefits but very few calories. About 3.5 ounces (100 grams) of raw spinach contain 2.7 mg of iron, or 15% of the DV. Although this is non-heme iron, which isn't absorbed very well, spinach is also rich in vitamin C. This is important since vitamin C significantly boosts iron absorption.



Spinach is also rich in antioxidants called carotenoids, which may reduce your risk of cancer, decrease inflammation, and protect your eyes from disease.

**3. Liver and other organ meats:** They are extremely nutritious. Popular types include liver, kidneys, brain, and heart, all of which are high in iron. For example, a 3.5-ounce (100-gram) serving of beef liver contains 6.5 mg of iron, or 36% of the DV. Organ meats are also high in protein and rich in B vitamins, copper, and selenium.

**4. Legumes:** They are loaded with nutrients. Some of the legumes are beans, lentils, chickpeas, peas, and soybeans. They're a great source of iron, especially for vegetarians. One cup (198 grams) of cooked lentils contains 6.6 mg, which is 37% of the DV. Beans like black beans, navy beans, and kidney beans can all help easily bump up your iron intake. In fact, a half-cup (86-gram) serving of cooked black beans provides around 1.8 grams of iron, or 10% of the DV.

**5. Red meat:** It is satisfying and nutritious. A 3.5-ounce (100-gram) serving of ground beef contains 2.7 mg of iron, which is 15% of the DV. Meat is also rich in proteins, zinc, selenium; and several B vitamins.

**6. Pumpkin seeds:** Pumpkin seeds are a tasty, portable snack. A 1-ounce (28-gram) serving of pumpkin seeds contains 2.5 mg of iron, which is 14% of the DV. In addition, pumpkin seeds are a good source of vitamin K, zinc, and manganese. A 1-ounce (28-gram) serving contains 40% of the DV for magnesium, which helps reduce your risk of insulin resistance, diabetes, and depression.

**7. Turkey:** Turkey meat is a healthy and delicious food. It's also a good source of iron, especially dark turkey meat. A 3.5-ounce (100-gram) portion of dark turkey meat has 1.4 mg of iron, which is 8% of the DV. Dark turkey meat also packs an impressive 28 grams of protein per serving and several B vitamins and minerals.

**8. Broccoli:** Broccoli is incredibly nutritious. A 1-cup (156-gram) serving of cooked broccoli contains 1 mg of iron, which is 6% of the DV. A serving of broccoli also packs 112% of the DV for

vitamin C, which helps your body absorb the iron better.

**9. Fish:** Fish is a highly nutritious ingredient, and certain varieties like tuna are especially high in iron. In fact, a 3-ounce (85-gram) serving of canned tuna contains about 1.4 mg of iron, which is approximately 8% of the DV. Fish is also brimming with omega-3 fatty acids, which are a type of heart-healthy fat associated with a number of health benefits. In particular, omega-3 fatty acids have been shown to promote brain health, enhance immune function, and support healthy growth and development. Fish also contains several other essential nutrients, including niacin, selenium, and vitamin B12.

### 13. Write about the Sources of Zinc.

**Ans: 1. Meat:** Meat is an excellent source of zinc. Red meat is a particularly great source, but ample amounts can be found in all different kinds of meat, including beef, lamb and pork. In fact, a 100-gram (3.5-ounce) serving of raw ground beef contains 4.8 mg of zinc, which is 44% of the Daily Value (DV). This amount of meat also provides 176 calories, 20 grams of protein and 10 grams of fat. Plus, it's a great source of many other important nutrients, such as iron, B vitamins and creatine..

**2. Shellfish:** Shellfish are healthy, low-calorie sources of zinc. Oysters contain particularly high amounts, with 6 medium oysters providing 32 mg, or 291% of the DV. Other types of shellfish contain less zinc than oysters but are still good sources. In fact, Alaskan crab contains 7.6 mg per 100 grams (3.5 ounces), which is 69% of the DV. Smaller shellfish like shrimp and mussels are also good sources, both containing 14% of the DV per 100 grams (3.5 ounces). Shellfish like oysters, crab, mussels and shrimp can all contribute to your daily zinc needs.

**3. Legumes:** Legumes like chickpeas, lentils and beans all contain substantial amounts of zinc. In fact, 100 grams of cooked lentils contain around 12% of the DV .However, they also contain

phytates. These antinutrients inhibit the absorption of zinc and other minerals, meaning zinc from legumes isn't as well absorbed as the zinc from animal products. They are also an excellent source of protein and fiber and can be easily added to soups, stews and salads. Heating, sprouting, soaking or fermenting plant sources of zinc like legumes can increase this mineral's bioavailability. Legumes contain high amounts of zinc.

**4. Seeds:** Seeds are a healthy addition to your diet and can help increase your zinc intake. 3 tablespoons (30 grams) of hemp seeds contain 31% and 43% of the recommended daily intake for men and women, respectively. Other seeds containing significant amounts of zinc include squash, pumpkin and sesame seeds. In addition to boosting your zinc intake, seeds contain fiber, healthy fats, vitamins and minerals, making them an excellent addition to your diet. Including them as part of a healthy diet has also reduced cholesterol and blood pressure.

**5. Nuts:** Eating nuts such as pine nuts, peanuts, cashews and almonds can boost your intake of zinc. Nuts also contain other healthy nutrients, including healthy fats and fiber, as well as a number of other vitamins and minerals. If you're looking for a nut high in zinc, cashews are a good choice. A 1-ounce (28-gram) serving contains 15% of the DV. Nuts are also a quick and convenient snack and have been linked to a reduction in risk factors for some diseases, like heart disease, cancer and diabetes.

**6. Dairy:** Dairy foods like cheese and milk provide a host of nutrients, including zinc. Milk and cheese are two notable sources, as they contain high amounts of bioavailable zinc, meaning most of the zinc in these foods can be absorbed by your body. For example, 100 grams of cheddar cheese contains about 28% of the DV, while a single cup of full-fat milk contains around 9%. These foods also come with a number of other nutrients considered important for bone health, including protein, calcium and vitamin D.

**7. Eggs:** Eggs contain a moderate amount of zinc and can help you meet your daily target. For example, 1 large egg contains around 5% of the DV. This comes with 77 calories, 6 grams of protein, 5 grams of healthy fats and a host of other vitamins and minerals, including B vitamins and selenium.

**8. Whole Grains:** Whole grains like wheat, quinoa, rice and oats contain some zinc. However, like legumes, grains contain phytates, which bind to zinc and reduce its absorption. However, they are considerably better for your health and a good source of many important nutrients like fiber, B vitamins, magnesium, iron, phosphorus, manganese and selenium.

**9. Some Vegetables:** In general, fruits and vegetables are poor sources of zinc. Potatoes, both regular and sweet varieties, contain approximately 1 mg per large potato, which is 9% of the DV. Other vegetables like green beans and kale contain less, at around 3% of the DV per 100 grams. Although they don't contain a lot of zinc, eating a diet rich in vegetables has been linked to a reduced risk of chronic diseases like heart disease and cancer.

#### **14. Write about the Sources of Iodine**

**Ans:** Iodine is an essential mineral you must get from your diet. Interestingly, your thyroid gland needs it to produce thyroid hormones, which have many important responsibilities in your body. The recommended daily intake (RDI) of iodine is 150 mcg per day for most adults. For women who are pregnant or nursing, the requirements are higher. In fact, one-third of the population is at risk of deficiency, particularly those who live in areas that have only a small amount of iodine in the soil, including European countries. Iodine deficiency can lead to swelling of the thyroid gland, known as goiter, and hypothyroidism, which can cause fatigue, muscle weakness and weight gain.

**1. Seaweed:** Seaweed is a good source of antioxidants, vitamins and minerals. It's also low in calories. Seaweed is one of the best natural sources of iodine. Three popular seaweed varieties include kombu kelp, wakame and nori.

a) **Kombu Kelp:** Kombu kelp is a brown seaweed sold dried or as a fine powder. Kombu kelp can contain up to 2,984 mcg of iodine per seaweed sheet (1 gram). This provides almost 2,000% of the recommended daily intake. Excess iodine consumption is well-tolerated in the majority of people but could result in thyroid dysfunction for those who are susceptible.

b) **Wakame:** Wakame is another type of brown seaweed that is slightly sweet in flavor. It is commonly used to make miso soup. Wakame from Asia has higher amounts of iodine than wakame from Australia and New Zealand. One study found that the average amount of iodine in wakame seaweed from various parts of the world was 66 mcg per gram, or 44% of the daily recommended intake.

c) **Nori:** Nori is a type of red seaweed. Nori is the type of seaweed that is commonly used in sushi rolls. The iodine content in nori varies between 16–43 mcg per gram, or about 11–29% of the daily value. Seaweed is an excellent source of iodine. However, the amount it contains depends on the species.

**2. Cod:** Cod is a versatile white fish that is delicate in texture and has a mild flavor. It is relatively low in fat and calories but offers a wide variety of minerals and nutrients, including iodine. For instance, 3 ounces (85 grams) of cod has approximately 63–99 mcg, or 42–66% of the daily recommended amount. Higher amounts of iodine are found in fish low in fat compared to fatty fish. For instance, a lean fish like cod can provide up to 66% of the daily value.

**3. Dairy:** Dairy products are major sources of iodine. 1 cup of milk can provide 59–112% of the recommended daily amount of iodine. Yogurt is also a good dairy source of iodine. One cup of plain

yogurt provides approximately half of the daily recommended amount. The amount of iodine in cheese varies depending on the type. Cottage cheese is one of the best sources of iodine. One cup of cottage cheese provides 65 mcg, while one ounce of cheddar cheese provides about 12 mcg.

**4. Iodized Salt:** The addition of iodine in table salt began in the US in the early 1920s to help decrease the occurrence of goiters, or swelling of the thyroid gland. There is approximately 71 mcg of iodine in 1/4 teaspoon of iodized salt, which is 47% of the daily recommended intake. However, salt also contains sodium. Nevertheless, salt only seems to raise blood pressure in salt-sensitive individuals, which is about 25% of the population. Iodized and uniodized salt are commonly sold in grocery stores. Consuming 1/2 teaspoon of iodized salt per day provides enough iodine to prevent a deficiency.

**5. Shrimp:** Shrimp is a low-calorie, protein-rich seafood that is a very good source of iodine. Additionally, shrimp provides key nutrients such as vitamin B12, selenium and phosphorus. Shrimp and other seafood are good sources of iodine because they absorb some of the iodine that is naturally present in seawater. Three ounces of shrimp contain about 35 mcg of iodine, or 23% of the daily recommended intake. Shrimp is a good source of protein and many nutrients, including iodine. Three ounces of shrimp provide approximately 23% of the daily value.

**6. Tuna:** Tuna is also a low-calorie, high-protein, iodine-rich food. Furthermore, it is a good source of potassium, iron and B vitamins. Tuna is also a good source of omega-3 fatty acids which may lower your risk of heart disease. Fish higher in fat offer lower amounts of iodine. Since tuna is a fattier fish, the amount of iodine found in tuna is lower than leaner fish varieties, such as cod. However, tuna is still a relatively good source of iodine, as three ounces provide 17 mcg, or about 11% of the recommended daily intake. Tuna offers less iodine than lean fish but is still a relatively

good source. Three ounces of tuna provide about 11% of the daily recommended amount.

**7. Eggs:** Eggs are also a good source of iodine. For fewer than 100 calories, one whole egg provides a lean source of protein, healthy fats and a wide assortment of vitamins and minerals. However, the majority of these nutrients, including iodine, come from the yolk. Egg yolks are a good source of iodine because it is added to chicken feed. Yet since the content of iodine in chicken feed can vary, the amount found in eggs can also fluctuate. On average, one large egg contains 24 mcg of iodine, or 16% of the daily value. The majority of iodine in eggs is found in the yolk. On average, one large egg provides 16% of the daily recommended amount.

**8. Prunes:** Prunes are plums that have been dried. Prunes are a good vegetarian or vegan source of iodine. Five dried prunes provide 13 mcg of iodine, or about 9% of the daily value. Prunes are commonly known for helping relieve constipation. This is because of their high content of fiber and sorbitol, a type of sugar alcohol. Prunes are high in many vitamins and nutrients, including vitamin K, vitamin A, potassium and iron. Because of the nutrients prunes offer, they may help improve heart health, decrease the risk of colon cancer and even help manage weight by decreasing appetite. Prunes are packed with vitamins and nutrients. Five dried prunes provide a good vegetarian source of iodine by meeting 9% of the daily value.

**9. Lima Beans:** Lima beans are commonly associated with the popular Native American dish succotash, which mixes lima beans and corn. Lima beans are a good source of fiber, magnesium and folate, making them a heart-healthy choice. They are also a relatively good vegetarian or vegan source of iodine. Due to the variation of iodine in soil, irrigation water and fertilizers, the amount of iodine can vary in fruits and vegetables. However, on average, one cup of cooked lima bean contains 16 mcg of iodine, or 10% of the daily value.

**15. Effects of deficiency of water**

**Ans:** Water makes up 60% of the human body and is needed to help maintain a healthy weight, flush toxins from the body, and produce bodily fluids like saliva. Water also contributes to regular bowel function, optimal muscle performance, and clear, youthful-looking skin. However, failing to drink enough water can cause dehydration and adverse symptoms, including fatigue, headache, weakened immunity, and dry skin.

**1. Persistent Bad Breath:** Water is essential for saliva production and helps rinse away bacteria so you can maintain healthy teeth and gums. Lack of water inhibits saliva production and causes bacteria to build up on the tongue, teeth, and gums, contributing to bad breath. If you practice good oral hygiene, yet continue suffering from chronic bad breath, it's possible you may not be drinking enough water.

**2. Fatigue:** Not drinking enough water can cause an overall fluid loss in the body. This fluid loss can lead to a decrease in blood volume that puts excess pressure on the heart to deliver oxygen and nutrients to the organs, including the muscles. Lack of water can cause you to experience periods of fatigue and low energy as your body tries to function without enough water. If you're constantly feeling sluggish and tired despite getting a quality night's sleep, you may need to boost your water intake.

**3. Frequent Illness:** Water helps flush toxins, waste, and bacteria from the body to fight disease and infection as well as strengthens your immune system so you become sick less frequently. If it seems as though you're always getting sick, you may need to start drinking more water to keep your body free of toxins and functioning at an optimal level. Since lack of water also causes fatigue, you may tend to be less physically active—another risk factor for weakened immunity.

**4. Constipation:** Water promotes good digestion and regular bowel movements by keeping your stool soft and moving it easily

through the digestive tract. Not drinking enough water can cause your body to pull water from stool to compensate for fluid loss, leading to harder and firmer stool that is more difficult to pass. If your bowel movements are irregular and infrequent, try drinking more water to loosen your stools and relieve constipation and bloating.

**5. Poor Skin Health:** Water hydrates and plumps skin cells to make your skin look brighter, vibrant, and more youthful. However, lack of water can cause skin to lose its plumpness and elasticity—leading to dryness, flakiness, fine lines, wrinkles, and sagging skin. Water even helps reduce acne and other skin problems by flushing harmful toxins from the body. If beauty products and skin treatments are failing to improve the appearance of your skin, drink more water to achieve a more youthful appearance and to reduce or improve skin problems.

**6. Sugar Cravings:** Dehydration interferes with the body's ability to reach into glucose stores for energy and can trigger cravings for foods high in sugar and carbohydrates. Unusual and sudden cravings for sugary foods like chocolate, donuts, cookies, and candies may indicate that your body is in great need of water—not food. If you're experiencing sugar cravings or hunger pangs even though you've recently eaten, try drinking more water to rehydrate your body and keep cravings at bay.

**7. Decreased Urination:** When your body is dehydrated, the kidneys retain as much fluid as possible to maintain their function. This can lead to decreased urination—one of the most common signs of low water intake. Lack of water can cause your urine to become darker in color, stronger in odor, and cloudier in appearance. You may also face a higher risk of urinary tract infection when your body lacks enough water to flush out toxins and bacteria. You'll know you're drinking enough water when you start urinating more frequently and the urine is clearer, lighter in color, and far less odorous.

## SHORT ANSWER QUESTIONS

**16 Requirement of water.**

**Ans:** Check your weight in kilograms: This formula calculates your water requirement based on your weight, simply because a 45 kilo person doesn't require the same amount of water as an 85 kilo person. Divide the figure by 30: Divide your weight by 30. The answer is the number of litres you should be drinking per day. So, if you weigh 60 kilos for example, you should drink 2 litres of water a day, whereas if you weigh 80 kilos, you should drink 2.6 litres (2 litres and 600 ml) of water per day. Add more water for physical activity: If you exercise, you probably lose a lot of water through sweat. Add 0.35 litres (350 ml) to the figure for every half an hour that you exercise. So, if you exercise for an hour every day, add 0.7 litres (700 ml) of water to your daily requirement.

The number you are left with is the number of litres of water your body requires every day. Remember that food has water in it too:

Luckily, you don't have to drink all of that water in liquid form, because your food has water in it too. In fact, approximately 20 - 25% of your water intake comes from the food you eat. This chart shows you how much water each of the common fruits and vegetables have. The column you need to look at is the water weight column, where 1 gram of water = 1 ml of water. So, if you eat an apple for example, it has 116 grams of water, so you can drink 116 ml (0.116 litre) less water that day.

**17. Health Benefits of a Balanced Diet:**

**Ans:**

- Choosing a balanced and varied diet is a vital step towards leading a happy and disciplined lifestyle.
- Vitamins and minerals in the diet are essential for building a robust immune system and healthy bodily functions.

- c) A balanced diet can safeguard the body against certain types of chronic diseases such as obesity, diabetes, heart diseases, cancers, and other conditions.
- d) A healthy diet supports maintaining an ideal body weight.
- e) The benefits of eating balanced and varied foods uplifts emotional and mental well-being.

### Foods To Avoid:

- Processed foods
- Refined grains
- Added sugar and salt
- Red and processed meat
- Alcohol
- Trans and saturated fat

### **18. What are the basics of meal planning?**

**Ans: 1. Make a menu:** Decide which recipes you will make for lunch and dinner and make a list of the items that you will need from the grocery store. When you have a plan, you will be less likely to spend money on fast food or convenience meals.

**2. Plan your meals around foods that are on sale:** Check store flyers, newspaper inserts and coupon sites online. You may be surprised at the good buys available. Just be sure to buy and plan for foods that you will actually use so that they don't go to waste.

**3. Plan at least one meatless meal a week:** Legumes (beans, lentils, dried peas), eggs, tofu, peanut butter and canned fish offer great tasting protein at a good price.

**4. Check your pantry, refrigerator and freezer:** Look at the expiry dates of the foods and ingredients you already have on hand. Which ones do you need to use up? Look for recipes that use those foods and ingredients.

**5. Enjoy grains more often:** Grains such as rice, pasta, barley and couscous are inexpensive and can be used in many different recipes. Try them in soups, stews and salads such as chicken Bulgur salad.

**6. Avoid recipes that need a special ingredient:** Some recipes call for a special ingredient that you may not have. How much does that ingredient cost? Does it come in a small or big package? Can you use it in other recipes before it goes bad? It may not be worth the money to buy an ingredient if you are only going to use it once. Leave the ingredient out or try the recipe with an ingredient that you already have at home. It's fun to experiment while cooking and you may surprise yourself with the finished dish.

**7. Look for seasonal recipes:** Vegetables and fruit are cheaper when they're in season.

**8. Plan to use leftovers:** Think about how you can use leftovers. If you're cooking roast chicken with rice and vegetables for Sunday night's supper, then make chicken sandwiches for Monday's lunch. On Tuesday, use the bones to make a chicken soup and toss in any leftover vegetables and rice.

**9. Know what your family likes to eat:** Encourage your family to share their favourites and help with menu planning. That way you can look for favourite ingredients and foods when they go on sale.

#### 19. Carbohydrate deficiency.

**Ans: Short-term health effects:** Initially, low-carbohydrate diets may contribute to rapid weight loss because they restrict kilojoules or energy. The body begins to use stores of glucose and glycogen (from the liver and muscles) to replace the carbohydrates it is not getting from food. Around 3g of water is needed to release 1g of glycogen. Any weight loss at the beginning of a low-carbohydrate diet is mostly water, not body fat.

As carbohydrate stores are used up, the body begins to rely on other sources of fuel such as fat. This can lead to the development of ketones in the body, which can make the body acidic. It can also contribute to metabolic changes, which may be dangerous for some with certain conditions (such as diabetes).

Symptoms that may be experienced from a low-carbohydrate diet, include:

- Nausea.
- Dizziness.
- Constipation.
- Fatigue.
- Dehydration.
- Bad breath.
- Loss of appetite.

#### *Long-term health effects:*

The long-term health effects of a diet very low in carbohydrates but high in saturated fat is still uncertain. Further research is needed to determine the safety of these diets.

Possible long-term effects may include:

- Weight gain – when a normal diet is resumed, some muscle tissue is rebuilt, water is restored, and weight quickly returns.
- Bowel problems – restricted intake of antioxidants and fibre from fruits and vegetables can increase a person's risk of constipation.
- Dieting problems – such as the 'yo-yo' effect (where people lose and regain weight many times over a long period, rather than sustaining weight loss).
- High Cholesterol obesity and obesity related disorders – diets high in protein and fats are associated with conditions, (such as heart disease, diabetes and cancer). This can occur if you have a diet high in fat, especially from fatty and processed meats (such as salami, sausages and bacon).
- Kidney problems – can occur in people with impaired kidney function or diabetes.
- Osteoporosis and related conditions – due to loss of calcium from the bones.

## 20. Effects of deficiency of vitamins.

Ans:

Vitamin	Consequence
Vitamin B <sub>1</sub>	Fatigue, mental changes (e.g. apathy, decrease in short-term memory, confusion and irritability), visual difficulties Frank deficiency: beriberi, Wernicke-Korsakoff syndrome
Vitamin B <sub>2</sub>	B <sub>2</sub> deficiency is most often accompanied by other micronutrient deficiencies Severe B <sub>2</sub> deficiency may impair the metabolism of vitamin B <sub>6</sub> and the conversion of tryptophan to niacin
Vitamin B <sub>6</sub>	Depressed mood and neurological disturbances Frank deficiency: peripheral neuropathy, convulsions, depression and confusion
Vitamin B <sub>12</sub>	Fatigue and weakness, irritability, depressed mood, loss of concentration to memory loss, mental confusion, disorientation Frank deficiency: peripheral neuropathy, subacute combined system degeneration, frank dementia
Folic acid	Symptoms of folate deficiency include depression, insomnia, forgetfulness and difficulty in concentrating, irritability, apathy, fatigue and anxiety
Biotin	Irritability, depressed mood, central nervous system abnormalities
Nicotinamide	Marginal deficiency: irritability, weakness, mental confusion and dizziness Frank deficiency: pellagra, dementia
Panthotenic acid	Irritability and restlessness, fatigue, apathy and malaise, neurobiological symptoms, such as numbness, muscle cramps. Myelin degeneration
Vitamin C	Weakness, fatigue, depression

## 21. Importance of Water

**Ans:**

1. It lubricates the joints: Cartilage, found in joints and the disks of the spine, contains around 80 percent water. Long-term dehydration can reduce the joints' shock-absorbing ability, leading to joint pain.
2. It forms saliva and mucus: Saliva helps us digest our food and keeps the mouth, nose, and eyes moist. This prevents friction and damage. Drinking water also keeps the mouth clean. Consumed instead of sweetened beverages, it can also reduce tooth decay.
3. It delivers oxygen throughout the body: Blood is more than 90 percent water, and blood carries oxygen to different parts of the body.
4. It boosts skin health and beauty: With dehydration, the skin can become more vulnerable to skin disorders and premature wrinkling.
5. It cushions the brain, spinal cord, and other sensitive tissues: Dehydration can affect brain structure and function. It is also involved in the production of hormones and neurotransmitters. Prolonged dehydration can lead to problems with thinking and reasoning.
6. It regulates body temperature: Water that is stored in the middle layers of the skin comes to the skin's surface as sweat when the body heats up. As it evaporates, it cools the body. When there is too little water in the body, heat storage increases and the individual is less able to tolerate heat strain. Having a lot of water in the body may reduce physical strain if heat stress occurs during exercise.
7. The digestive system depends on it: The bowel needs water to work properly. Dehydration can lead to digestive problems, constipation, and an overly acidic stomach. This increases the risk of heartburn and stomach ulcers.



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8. It flushes body waste: Water is needed in the processes of sweating and removal of urine and feces.
9. It helps maintain blood pressure: A lack of water can cause blood to become thicker, increasing blood pressure.
10. The airways need it: When dehydrated, airways are restricted by the body in an effort to minimize water loss. This can make allergies worse.
11. It makes minerals and nutrients accessible: These dissolve in water, which makes it possible for them to reach different parts of the body.
12. It prevents kidney damage: The kidneys regulate fluid in the body. Insufficient water can lead to kidney stones and other problems.
13. It boosts performance during exercise: Consuming more water might enhance performance during strenuous activity but dehydration reduces performance in activities lasting longer than 30 minutes.
14. Weight loss: Water may also help with weight loss, if it is consumed instead of sweetened juices and sodas. "Preloading" with water before meals can help prevent overeating by creating a sense of fullness.
15. It reduces the chance of a hangover: When partying, unsweetened soda water with ice and lemon alternated with alcoholic drinks can help prevent overconsumption of alcohol.

**22. What are the symptoms of mineral deficiency?**

**Ans:** The symptoms of a mineral deficiency depend upon which nutrient the body lacks. Possible symptoms include:

- constipation, bloating, or abdominal pain
- decreased immune system
- diarrhea
- irregular heart beat

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- loss of appetite
- muscle cramping
- nausea and vomiting
- numbness or tingling in the extremities
- poor concentration
- slow social or mental development in children
- weakness or tiredness

Item	Fruits			Item	Vegetables		
	Food Weight (g)	Water Weight	Percent Water		Food Weight (g)	Water Weight	Percent Water
Apple	138	116	84	Broccoli	44	40	91
Apricot	106	92	86	Cabbage (green)	35	32	93
Banana	114	85	74	Cabbage (red)	35	32	92
Blueberries	145	123	85	Carrots	72	63	87
Cantaloupe	160	144	90	Cauliflower	50	46	92
Gierries	68	55	81	Celery	40	38	95
Cranberries	95	82	87	Cucumber	52	50	96
Grapes	92	75	81	Eggplant	41	38	92
Grapefruit	123	112	91	Lettuce (iceberg)	20	19	96
Orange	140	122	87	Peas (green)	72	57	79
Peach	87	76	88	Peppers (sweet)	50	46	92
Pear	166	139	84	Potato (white)	112	88	79
Pineapple	155	135	87	Radish	45	43	95
Plum	66	56	85	Spinach	28	26	92
Raspberries	123	106	87	Zucchini	65	62	95
Strawberries	149	136	92	Tomato (red)	123	115	94
Watermelon	160	146	92	Tomato (green)	123	114	93

### 23. Vitamin A source and deficiency.

**Ans: Vitamin A:** Carrots are the dietary sources of vitamin A. Vitamin A helps to maintain healthy vision. Without vitamin A, a person could experience vision problems and possibly vision loss. Vitamin A is not a single vitamin but a collection of compounds known as retinoids. Retinoids occur naturally in the human body, and they are present in some dietary sources.

Some foods provide retinols, which the body can use directly as vitamin A.

**Function:** Vitamin A supports several functions throughout the body, including: vision, the immune system

**Dietary sources:** People can obtain vitamin A through dietary sources. Animal sources provide preformed vitamin A, or retinols. This type is ready for the body to use. Plant sources provide carotenoids, such as beta carotene, which is a powerful antioxidant. The body can convert these into vitamin A.

Animal sources of vitamin A include: fish liver oil, beef liver, cheese, milk, and other dairy products. Sources of beta carotene include: sweet potato, kale, spinach, and other green, leafy vegetables, carrots, cantaloupe, black-eyed peas, fortified breakfast

Age (years)	1-3	4-8	9-13	14 and over
Female	300	400	600	700
Male	300	400	600	900

#### Deficiency:

Vitamin A deficiency can affect a person who:

- ❖ follows a plant-based diet
- ❖ Has cystic fibrosis

A long-term deficiency can lead to a loss of night vision and possibly a total loss of vision.

Symptoms of an overdose include: headaches, fatigue, nausea and dizziness. In severe cases, coma and death can result.

**24. Write about Vitamin D source and deficiency:**

**Ans:** The body obtains the compounds it needs to make vitamin D from food. It also produces vitamin D when ultraviolet (UV) light meets the skin.

**Types:** Vitamin D is not a single substance but a group of compounds collectively known as calciferol. The body absorbs calciferol into the bloodstream and then converts it to calcitriol. Two types occur naturally:

- ❖ vitamin D-3, found in animal fats
- ❖ vitamin D-2, found in plants, such as mushrooms

**Function:** Vitamin D has two main roles in the body:

- ❖ It maintains bone health.
- ❖ It supports the immune system.

**Dietary sources:** A person can obtain some vitamin D from the sun, but most people will also need to use other sources, too. The main alternative is food. Dietary sources include: oily fish and fish oils, fortified dairy products, plant-based milks, and cereals, beef liver, eggs. People of all ages intake of 600 IU of vitamin D daily.

**Deficiency:** A vitamin D deficiency can affect:

- ❖ older adults and children who do not spend much time out of doors
- ❖ people with darker skin
- ❖ some people with chronic health conditions
- ❖ those who live far from the Equator, where winter days are short
- ❖ those with obesity

The main effects of vitamin D deficiency include:

- ❖ osteoporosis, or loss of bone mass
- ❖ osteomalacia, when bones become soft
- ❖ rickets, when a child's bones do not develop as they should
- ❖ increased risk of infection and autoimmunity

**Overdose:** It is rare for a person to have too much vitamin D, but using supplements could trigger this. Having too much vitamin D could lead to high levels of calcium in the blood. This can lead to:

- ❖ nausea
- ❖ headaches
- ❖ low appetite and weight loss
- ❖ a buildup of calcium in tissues and blood vessels
- ❖ heart or kidney damage
- ❖ High blood pressure interfere with blood clotting.

**25. Write about vitamin E sources and deficiency symptoms.**

**Ans:** Vitamin E is an antioxidant that can help the body destroy free radicals. Free radicals are unstable atoms that can cause oxidative stress. Oxidative stress can lead to cell damage, and this can result in cancer and other diseases. Vitamin E may help protect the body from a range of health issues.

**Types:** There are eight forms of vitamin E, but only alpha-tocopherol meets humans' needs,

**Function:** Some reasons why the body needs vitamin E are:

- ❖ as an antioxidant
- ❖ to boost the immune system
- ❖ to dilate blood vessels and help prevent clotting

**Dietary sources:** Good sources of vitamin E include:

- ❖ wheat germ oil
- ❖ sunflower seeds and oil
- ❖ almonds, hazelnuts, and peanuts
- ❖ spinach and broccoli
- ❖ kiwi fruit and mango

E. Experts measure vitamin E intake in milligrams (mg) AT, but packaging currently uses international units (IU).

Age (years)	1–3 (mg)	4–8	9–13	14 and over
Female	6 mg (9IU)	7 mg (10.4 IU)	11 mg (16.4 IU)	15 mg (22.4 IU)
Male	6 mg (9IU)	7 mg (10.4 IU)	11 mg (16.4 IU)	15 mg (22.4 IU)

**Deficiency:** Vitamin E deficiency is rare, but it can affect

people with Crohn's disease or cystic fibrosis. These conditions affect the liver's ability to absorb vitamin E.

A deficiency can result in:

- ❖ nerve and muscle damage that affects movement and coordination
- ❖ vision problems
- ❖ a weakened immune system

**Overdose:** Obtaining vitamin E through natural sources is unlikely to lead to an overdose, although supplement use can increase this risk.

People who use blood-thinning medication, such as warfarin (Coumadin) should ask their doctor before taking vitamin E supplements, as these may

### 26. Write about Vitamin K sources and deficiency symptoms

**Ans:** Vitamin K helps the body form blood clots. Blood clotting is essential to prevent excessive bleeding.

**Types:** There are several types of vitamin K. The two most common groups are:

- ❖ Vitamin K-1 (phylloquinone), present in green, leafy vegetables and some other plant sources
- ❖ Vitamin K2 (menaquinones), present in animal sources and fermented foods

**Function:** Apart from blood clotting, vitamin K may also:

- ❖ lower the risk of heart disease

- ❖ enhance bone health
- ❖ reduce the buildup of calcium in the blood

**Dietary sources:** Food sources of vitamin K-1 and K-2 include:

- ❖ kale
- ❖ liver
- ❖ spinach
- ❖ parsley
- ❖ butter
- ❖ egg yolks

An amount assumed to provide nutritional adequacy, as follows:

Age (years)	1-3	4-8	9-13	14-18	19 and over
Female	30	55	60	75	90
Male	30	55	60	75	120

**Deficiency:** The body is not able to store as much vitamin K as it does vitamin A or D. This means a person needs a regular intake of vitamin K, and there is a higher chance of a deficiency.

A vitamin K deficiency may result in:

- ❖ excess bleeding
- ❖ lower bone density, in the long term.

## 27. Discuss about functions of carbohydrates and its effects of deficiency.

**Ans:** The word carbohydrate refers to a compound of carbon, hydrogen, and oxygen that is a major source of energy. Often formed by a plant, a carbohydrate may be a sugar, starch, or cellulose that typically breaks down into energy within the body.

**Functions:** Carbohydrates are the body's primary energy providers. The important functions of carbohydrates are listed below.

- ❖ They are also important in the diet due to specific functions they perform in the human body such as eliminating or

minimizing ketosis, breakdown of body protein, loss of cations and dehydration.

- ❖ In addition, carbohydrates are essential because they are precursors to carbohydrate derivatives that are actively involved in human metabolic processes.
- ❖ Carbohydrates serve as the primary energy source.
- ❖ Functions of carbohydrate systems in the molecular mechanisms responsible for the important aspects of living activity.
- ❖ They are essential for the oxidation of fats.
- ❖ They exert a sparing action on proteins.
- ❖ They provide the carbon skeleton for the synthesis of some nonessential amino acids.
- ❖ Carbohydrates provide a person with energy. People can also obtain energy from foods containing protein and fats, but carbohydrates are the body's preferred source.
- ❖ If a person does not have a good supply of carbohydrates, their body will use protein and fats as an energy source.
- ❖ However, as protein is vital for so many other essential functions, such as building and repairing tissues, the body prefers not to use it for energy.
- ❖ Carbohydrates break down into glucose in the body. Glucose moves from the bloodstream into the body's cells with the help of the hormone insulin. All of the cells in a person's body use glucose to function.
- ❖ The brain uses 20–25% of a person's glucose when they are at rest and is reliant on a constant supply.

*Common sources of naturally occurring carbohydrates include:*

- ❖ Fruits.
- ❖ Vegetables.
- ❖ Milk.
- ❖ Nuts.
- ❖ Grains.

- ❖ Seeds.
- ❖ Legumes.

**Deficiency:** If deficient in carbohydrates, the body will utilize protein and fats for energy. Carbohydrates are the body's most preferred source of energy, and it is not recommended to avoid this group of foods when avoiding gluten. The body is an efficient energy burner and will take or make glucose from other sources and use it for energy.

**Deficiency of Carbohydrates causes:**

- ❖ Muscle cramps
- ❖ Muscle fatigue
- ❖ Headache
- ❖ Dizziness
- ❖ Confusion
- ❖ Fast heart beat
- ❖ Sweating
- ❖ Acidosis
- ❖ Ketosis
- ❖ Hypoglycemia
- ❖ Constipation

**Overconsumption:**

- ❖ Increase dental caries
- ❖ Cause Obesity
- ❖ Large amount of sugar- Gastric ulcer
- ❖ Depress appetite - Soft Drink
- ❖ Increase blood Triglyceride - Lead to Heart Disease.

**28. Write an essay on functions of Lipids, dietary sources and deficiency disorders.**

**Ans:** The word "lipid" is another word for "fat." Lipids can be both solid or liquid at room temperature, in which case they are called fats or oils, respectively. Lipids are synthesized in the body using complex

biosynthetic pathways. However, there are some lipids that are considered essential and need to be supplemented in diet.

#### **Functions:**

**Helps you absorb vitamins:** Vitamins A, D, E, and K are fat-soluble, meaning your body can absorb them only when you consume them along with fat. A lack of fat in your diet can cause deficiencies in these vitamins, which can lead to a variety of health issues.

**Supports cell growth:** Fat provides structure to the outer membrane of every cell in your body.

**Supports brain and eye health:** The omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) help maintain the health of your brain, central nervous system, and retinas. Your body doesn't make these fatty acids — you can only get them from your diet.

**Wound healing:** Essential fatty acids play a key role in wound healing and blood clotting.

**Hormone production:** Your body needs dietary fat in order to make specific hormones, including the sex hormones testosterone and estrogen.

**Source of energy:** Each gram of fat you consume provides you with about 9 calories of energy. For comparison, each gram of carbohydrate or protein yields only 4 calories of energy.

#### **Sources:**

- ❖ Commonly consumed oils are canola, corn, olive, peanut, safflower, soy, and sunflower oil.
- ❖ Foods rich in oils include salad dressing, olives, avocados, peanut butter, nuts, seeds, and some fish.
- ❖ Fats are found in animal meat, dairy products, and cocoa butter.

#### **Deficiency causes:**

- ❖ Dietary fat deficiency is rare in healthy people who eat a balanced, nutritious diet. However, some conditions can put you at risk for fat deficiency, such as:
- ❖ Eating disorders

- ❖ Large bowel resection (colectomy)
- ❖ Inflammatory bowel disease
- ❖ Cystic fibrosis
- ❖ Pancreatic insufficiency
- ❖ An extremely low-fat diet

***Overconsumption causes:***

- ❖ Heart disease
- ❖ Obesity
- ❖ Cardiovascular disease, and other problems.

***29. What are the food sources of Calcium.***

**Ans:** Humans need calcium to build and maintain strong bones, and 99% Trusted Source of the body's calcium is in the bones and teeth. It is also necessary for maintaining healthy communication between the brain and other parts of the body. It plays a role in muscle movement and cardiovascular function.

***Food sources of Calcium:***

- ❖ Cheese
- ❖ Yogurt
- ❖ Milk
- ❖ Sardines
- ❖ Dark green leafy vegetables like spinach, kale, turnips, and collard greens
- ❖ Fortified cereals such as Total, Raisin Bran, Corn Flakes
- ❖ Fortified orange juice.
- ❖ Soybeans
- ❖ Fortified soymilk
- ❖ Enriched breads, grains, and waffles

**30. Mention the sources of Water.**

**Ans: Sources of Water:** There are various sources of water. About 97% of the water on the Earth's surface is covered with water. The three main sources of water are:

- ❖ Rainwater.
- ❖ Groundwater – This includes water bodies like Wells and Springs.
- ❖ Surface water – This includes different water bodies like Sea, Oceans, Reservoirs, Rivers, Streams, Ponds, Lakes and Tanks.

**Food sources:**

- ❖ You get some of the water in your body through the foods you eat.
- ❖ Some of the water is made during the process of metabolism.
- ❖ You also get water through liquid foods and beverages, such as soup, milk, tea, coffee, soda, drinking water, and juices. Alcohol is not a source of water because it is a diuretic. It causes the body to release water.

