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Research Paper

HEALTHY FOOD FOR HEALTHY LIFE

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Abstract

Nutrition depends upon food is also of utmost importance in the cure of disease. Nutrients are required for build up and maintenance of healthy cells, tissues, glands and organs which aid in metabolic, hormonal, mental, physical or chemical activities of human body. The right kind of food is the most important single factor in the promotion of health. A balanced diet is of utmost importance for the maintenance of good health and healing of diseases. A correct diet should contain liberal quantities of seeds, nuts, grains, vegetables and fruits which provide adequate quantities of all essential nutrients. The acid-alkaline balance plays an important role in the balanced body chemistry. Our daily diet should consist of 80% alkaline forming foods and 20% acid forming foods which can provide sufficient amounts of carbohydrates, fat, proteins, vitamins, minerals, dietary fibres, enzymes and amino acids.

INTRODUCTION

Food plays a vital role in the maintenance of good health and both in prevention and cure of diseases. According to Sir Robert McCarrison 'The right kind of food is the most important single factor in the promotion of health; and the wrong kind of food is the most important single factor in the promotion of disease'. In other words nutrition depends upon food is also of utmost importance in the cure of disease. Nutrients are required for build up and maintenance of healthy cells, tissues, glands and organs which aid in metabolic, hormonal, mental, physical or chemical activities of human body. It is reported that that at least 45 essential nutrients are needed by human cells. These include oxygen, water and five major groups namely carbohydrates, fats, proteins, minerals and vitamins. All 45 of these nutrients are vitally important and they function together and the absence of any them will result in disease and eventually in death.

Sources of nutrients

A balanced diet is of utmost importance for the maintenance of good health and healing of diseases. Such a diet should be composed of foods which in combination would supply all these essential nutrients. A correct diet should contain liberal quantities of seeds, nuts, grains, vegetables and fruits which provide adequate quantities of all these essential nutrients. The diet containing all these basic food groups is optimum for vigour and vitality.

Seeds, nuts and grains: These are the most potent of all foods and contain all the important nutrients needed for human growth. Millets, wheat, oats, barley, brown rice, beans and peas are highly valuable in building health. Wheat, mung beans, alfalfa seeds, peas, Bengal grams and soybeans make excellent sprouts. Sunflower seeds, pumpkin seeds, almonds, peanuts and soybeans contain complete proteins of high biological value. Seeds, nuts and grains are also excellent natural sources of essential unsaturated fatty acids necessary for health. They are also good sources of lecithin and vitamins which help in preservation of health and prevention of premature ageing. Besides, they are also rich sources of minerals and auxones that play an important role in the rejuvenation of cells and prevention of premature ageing.

Vegetables: Vegetables are rich source of vitamins, minerals, proteins, dietary fibres and other phytochemicals. Vegetables may be of different kinds and they include edible roots, stems, leaves, fruits and seeds. Vegetables are grouped into the following ways based on plant parts used for consumption.

Leaves: Cabbage, lettuce, spinach beet, amaranth, fenugreek, rhubarb, pot herbs and greens

Leaf stalk or petiole: Celery, rhubarb, Swiss card

Stem : Knolkhol, asparagus, amaranth, spinach

Tuber : potato, yam

Corms : Taro

Buds: Brussels sprouts

Flower and buds: Broccoli, cauliflower

Bracts and receptacle: Globe artichoke

Root : Radish, carrot, turnip, cassava, beet

Bulbs : onion, garlic, leek

Seeds : Pea, beans

Immature Fruits: egg plant, cucumber, bhindi

Mature Fruits: Tomato, pepper

Flower petals: Pumpkin, yucca, bak phool

Fleshy roots are good sources of energy and vitamin B. Seeds are high in carbohydrates and proteins and yellow are rich in vitamin A. Leaves, stems and fruits are rich sources of vitamin, minerals, water and roughage. In most of tubers and roots, the largest amounts of proteins and minerals are present directly under the skin and these are lost if vegetables are peeled. Vegetable pigments like carotenoids, anthocyanins and other flavonoids are found to be function as 'Chemopreventers' that give protection against certain forms of cancer and cardiovascular diseases. Anthocyanin protect mammalian cell lipoprotein from damage by free radicals. Nasunin, an anthocyanin occurs in brinjal inhibits brain cell lipid peroxidation caused by hydroxyl free radicals. Polyphenols including flavonoids lowers the risk of certain cancer and enhance detoxification activity in the liver. Flavonols include quercetin, kaempferol, fisetin and myrecetin available in onion tomato and beans have anticarcinogenic effect. Flavones including apigenin and luteolin detected in celery, tomato, brinjal, garlic and onion function as antioxidants by conserving £-tocopherol content of low density lipoproteins and membrane lipids in the reduced states. Isoflavonoids including diadzein and genistein found in leguminous vegetables and broccoli, asparagus and is believed to be phytoesterogenic. Tocopherols, known as vitamin E is protective against a number of cellular abnormalities like cardiovascular disease, cancer, sterility, muscular dystrophy, changes in nervous system and anaemia development. Fibres are reported to be available in kidney beans, spinach, baked potato and pop corn and it helps in the prevention of colon cancer. Glucosinolates like sinigrin and glucobrassicin occurring in cruciferous vegetables and allyl sulphides from onion and garlics aid in building and regulating the immune system (De and Bhattacharjee, 2010). Prolonged cooking and storage destroy these valuable nutrients.

Fruits: Like vegetables, fruits are excellent source of carbohydrates, minerals, vitamins, and enzymes. They are easily digested and cause a cleansing effect on the blood and digestive tract. Some fruits contain high alkaline properties, a high percentage of water and a low percentage of proteins and fats. Presence of organic acids and high sugar in fruits have immediate refreshing effects. Besides seasonal fresh fruits, dry fruits such as raisin, prunes and figs are also beneficial. Fruits are best eaten both at raw and ripe states. On cooking, they lose portions of nutrient salts and carbohydrates. Examples of nutrient rich fruits are given below (De and Bhattacharjee, 2008).

Carbohydrates: Raisin, dates, karonda, banana.

Proteins: Cashew nut, wood apple, nuts

Fats: Pecan nut, walnut, cashew nut, coconut, avocado, olive, almond

Vitamin A: Mango, papaya, dates.

Vitamin B_1: Cashew nut, banana.

Vitamin B_2: Bael, Papaya.

Vitamin B_6 : Banana

Vitamin C: Amla, orange, lime, guava

Ca: Apple, pear, and litchi.

P: Litchi, wood apple, cashew nut

Fe: Karanda, mango, guava, dates.

K: Apple

Malic acid: Apple, plum, cherry, banana, and apricot.

Citric acid: Citrus fruits, pineapple, pear, blueberries, strawberries.

Tartaric acid: Grape

Isocitric acid: Black berries

Milk: It is a complex mixture of lipids, carbohydrates, proteins and many other organic compounds and inorganic salts. Milk contain plenty of vitamins except vitamin C and enzymes like galactase, lactase and aldehydase (Meyer, 1987). The best way to take milk is in sour forms like yoghurt and cheese. Soured milk is preferred to sweet milk as it is easily assimilated. Milk helps to prevent intestinal putrefaction and constipation.

Vegetable oils: These are triglycerides of complex organic fatty acids like oleic acid, linolic acid and linolenic acid (Kochhar, 1998). Vegetable oils include non-drying oils such as groundnut, palm, olive, castor, rapeseed and almond oils; semi-drying oils like sesame, sunflower and con oils and drying oils like linseed, soybean and safflower oils. They help to increase calcium retention in the system, reduce the anaemia and liver and kidney related problems.

Animal proteins: Egg, fish and meat are rich sources of animal proteins that can be taken in limited quantities for healthy life.

Types of food

Foods can be classified into two categories namely acid producing or alkaline producing. Calcium, magnesium, sodium and potassium present in foods cause to the alkaline effect while sulphur, phosphorus and chlorine contribute to the acidic effect in the foods.

Acidic foods: Barley, raw banana, beans, bread, rice, wheat, maize, millets, eggs, lentil, meats, nuts except almonds, cakes, chicken, chocolate, coffee, oatmeal, peas, sugar, sea foods, tea.

Alkaline foods: Almonds, apples, apricots, ripe banana, beet, cabbage, carrot, cauliflower, celery, coconut, cheese, cucumber, dates, figs, grapes, lemons, lettuce, melons, milk, onions, oranges, parsley, peaches, pears, pineapple, potato, pumpkin, radish, raisin, spianach, soybeans, tomato, turnip

The acid-alkaline balance plays an important role in the balanced body chemistry. Our daily diet should consist of 80% alkaline forming foods and 20% acid forming foods.

Power of colours

Chromotherapy or use of colour is a supportive therapy along with other natural methods of preserving health such as correct diet, adequate rest and relaxation, exercise, yogic asanas and so on (Table 1).

Table 1. Sources and therapeutic action of different colours

Colour	Sources	Therapeutic action
Red	Beet, radish, red cabbage, tomato, red berries, watermelon	Treatment of low blood pressure, rheumatism, paralysis, anaemia, tuberculosis
Orange	Carrot, oranges, apricot, mango, peach, papaya	Treatment of kidney and gall stones, hernia, appendicitis
Violet	Brinjal, berries, black carrot, grapes	Treatment of nervous system, arthritis, insomnia
Yellow	Lime, lemon, grape fruits, pumpkin, melon, banana, mango, apple, guava	Stimulant to brain, liver and spleen. Treatment of diabetes, indigestion, kidney and liver disorders, constipation, eye and throat infections, impotence
Purple	Beet, plum, grapes, jamun	Treatment of constipation, leucorrhoea, stomach disorders, cataract, migraine, skin disorders
Green	Green fruits and vegetables	Treatment of hay fever, nervous disorders, ulcers, influenza, malaria, colds, eye sight and cancer
Blue	Blue plum, blue beans, blue grapes	Treatment of dysentery, colic, asthma, respiratory disorders, high blood pressures, skin irruptions

Vitamins and health

Vitamins are potent organic compounds required by living organisms in relatively small amounts to maintain a normal health (Roberts, 1986). They are broadly divided into two categories, fat soluble and water soluble. Vitamins A,D, E & K are fat soluble whereas vitamin B complex and C are water soluble. Animals are unable to manufacture many vitamins themselves and must have adequate amounts in the diet. Many vitamins are destroyed by light and heat. Foods must contain vitamin precursors that are converted into actual vitamin on entering the body. Functions, sources and deficiency symptoms of vitamins are given in Table 2.

Table 2. Functions, sources and deficiency symptoms of vitamins (Bakhru, 2010)

Vitamin	Functions	Sources	Deficiency symptoms
A	Essential for normal growth, vitality, good sight, healthy skin, cell division, differentiation, bone development and reproduction. Helps to prevent premature ageing.	Cod liver oils, whole milk, curds, butter, egg yolk, pumpkin, carrot, tomato, mango, papaya, orange, melon, dates, drumstick leaves, amaranth	Eye infection, poor vision, night blindness, skin disorders, lack of appetite
B_1 (Thiamine)	Essential for normal functioning of nervous systems, regulates carbohydrate metabolisms, appetite and aids indigestion	Wheat germ, Brewer's yeast, rice bran , wheat bran, pulse, nuts, peas, lime, green vegetables, milk, egg, banana, apple	Neuritis, beriberi, impairment of nervous and digestive systems, weakness of heart
B_2 (Riboflavin)	Essential for growth and general health, healthy eyes, skins, nails, and hairs. As co-enzyme in the metabolism of major nutrients	Green leafy vegetables, milk, cheese, wheat germ, egg, citrus fruits, banana, tomato, yeast, almond, sunflower seeds, spinach, beet, beans, bael	Burning sensation in the legs, lips, tongues and mouth sores. Premature wrinkles and eczema
B_3 (Niacin)	Essential for proper circulation, nervous system, protein and carbohydrate metabolism, synthesis of sex hormones, cortisone, thyroxin and insulin	Liver, fish, poultry meat, peanut, almonds, avocado, cauliflower, potato, brinjal , chilli, figs, prunes	Pellagra,, diarrhoea, insomnia, anaemia, mental disorder
B_6 (Pyridoxin)	A cofactor in many transamination, decarboxylation and deamination reactions. Helps in absorption of fat and proteins.	Liver, rice, milk, yeast, meat, beans, cabbage, cauliflower, spinach, sweet potatoes, grapes, prunes, avocados and banana	Dermatitis, anaemia, skin disorders, insomnia, migraine, headache, heart diseases
B_9 (Folic acid)	Essential for formation of Red Blood Cells, healing processes and protein metabolism	Spinach, lettuce, yeast, green beans,cabbage, mushrooms, peanuts, liver	Anaemia, skin disorders, hair loss, impaired circulation, fatigue, metal depression, red tongue
B_5 (Pantothenic acid)	Helps in the development of central nervous system, stimulates the adrenal glands and essential for conversion of fat & sugar into energy	Wheat germ, whole grain, bread, green vegetables, peanut, beans, liver, egg, pea, mushrooms, potatoes, sweet potatoes, broccoli	Chronic fatigue, hypoglycaemia, mental depression, greying of hair
B_{12} (Cyanocobalamin)	Essential for formation of Red Blood Cells and several metabolic and	Kidney, liver, meat, milk, egg, banana, peanut, sunflower	Pernicious anaemia, poor appetite, mental disorder

	enzymatic processes. Improves concentration, memory and balance.	seeds.	
C (Ascorbic acid)	Essential for growth and maintenance of the joints, bones, teeth and gums. It helps in protection against stress and harmful effect of toxic chemicals. It cures cold	Ctrus fruits, aonla, strawberries, kiwi fruit, tomato, sprouted green gram, sprouted Bengal gram, broccoli, cabbage	Scurvy, anaemia, bleeding gums, slow healing of sores and wounds, premature ageing
D (Calciferol)	Essential for bone and teeth formation, healthy functioning of thyroid glands. Assists in assimilation of calcium, phosphorus and other minerals from digestive tract	Sun rays, fish, milk, butter, eggs, lettuce, spinach, cauliflower, cabbage, sprouted seeds	Rickets, tooth decay, pyorrhoea, bone and muscular weakness
E (Tocopherols & tocotrienols	Essential for normal reproductive functions, fertility and physical vigour. It dilutes blood vessels and improves circulation. A good anti-oxidant for fatty acids, fat soluble vitamins and sex hormones.	Wheat germs, whole grain products, eggs, milk, olives, nuts, peanuts, avocados, almonds, broccoli	Sterility in men and abortion in females, degenerative development in coronary system, hear disease.
K	Necessary for proper clotting of blood, prevention of bleeding and normal liver function. Helps in reducing excessive menstrual flow	Egg yolk, cow's milk, yoghurt, alfalfa, spinach, cabbage, cauliflower, tomato	Diarhhoea, nausea, vomiting, liver, colitis

Minerals and health

Minerals are inorganic nutrients required for regulation and building the trillions of living cells which make up the body. They help to maintain the volume of water necessary for life processes in the body. They help draw chemical substances into and out of the cells and keep the blood and tissue fluid from becoming either too acidic or too alkaline. The mineral elements which are needed by the body in substantial amounts are calcium, phosphorus, iron, sulphur, magnesium, potassium and chlorine and in trace amounts are iodine, copper, cobalt, manganese, zinc, selenium, silicon, fluorine and others (Table 3). In general, vegetables are a richer source of minerals than fruits, but both vegetables and fruits are considered " nutrient-dense foods " in that they provide substantial amounts of micronutrients, such as minerals and vitamins (De, 2018).

Table 3. Functions, sources and deficiency symptoms of minerals

Minerals	Functions	Sources	Deficiency symptoms
Calcium	Essential for development of bones and teeth, for normal function of heart and all muscle activity. Aids in clotting process of blood, stimulates enzymes in digestive process, ensure proper foetal growth and speeds healing process	Milk & milk products, mustard seeds, dried coconut, finger millet, almonds, orange, lemon, fig, walnut, cabbage, apple, pear, litchi	Fragile bones, teeth decay, heart palpitation, muscle cramps, irritability
Phosphorus	Inorganic phosphate is essential for skeletal mineralization and for multiple cellular functions, including glycolysis, gluconeogenesis, DNA synthesis, RNA synthesis, cellular protein phosphorylation, phospholipid synthesis and intracellular regulatory roles. Phosphorus is a primary bone-forming mineral	Cereals, pulses, nut, egg yolks, fruit juice, milk, legumes, wood apple, litchi	Retarded growth, reduced sexual power, loss of weight
Iron	Necessary for production of haemoglobin. Increases resistance to disease and stress. It distributes the oxygen inhaled into lungs to all cells. A master material which creates warmth, vitality and stamina	Grapes, raisin, spinach, whole grain, cereals, dried beans, beets, dates, liver, egg, yolk, Karanda, green pea, broccoli	Anaemia, shortness of breath, mental depression, pale complexion
Sulphur	Essential nutrient required for growth, primarily used to synthesize cysteine and methionine. The sulfur-containing amino acids play pivotal roles in the structural and catalytic functions of proteins. It dissolves the waste materials in the body and helps to eject some of the waste and poisons from the system. Essential for	Red gram, green gram, radish, cabbage, broccoli, cauliflower, dried beans, fish, eggs	Eczema, unhealthy growth of hair and nails

	synthesis of vitamin B_1.		
Magnesium	Magnesium is important in protein synthesis, release of energy from muscle storage and body temperature regulation. It is critical for proper heart function and plays a role in bone formation. Magnesium activates over 100 enzymes. It helps to prevent calcium deposits in gall stones and kidneys	Green vegetables, nuts, soybeans, alfalfa, apples, figs, legumes, peach, almonds, brown rice, sunflower seeds, sesame seeds	Kidney damage, Kidney stones, muscle cramps, heart attack, epileptic seizures, marked depression, confusion, nervous irritability, premature wrinkles
Potassium	It reduces blood pressure and blunting the effects of salt. Potassium also regulates heartbeat, assists in muscle contraction and is required to send nerve impulses and to release energy from fat, carbohydrates and protein. Maintains acid-alkaline balance in blood, prevents hyper acidity, promotes secretion of hormones, helps kidneys in detoxification of blood, prevents female hormonal disorders and overcome fatigue.	Green gram, cowpea, black gram, lotus stems, sword beans, legumes, milk, cheese, potato peels, banana, apple, root vegetables	Body tiredness, heart palpitation, cloudiness of mind, nervous shaking, perspiration of hand and feet, great sensitivity of nerves to cold
Chlorine	Essential for proper distribution of carbon di oxide, manufacture of glandular hormone secretion, regulates the alkali-acid balance in the blood and prevents the building of excessive fats and auto-intoxication. It aids in the cleaning out of body waste by helping liver to function.	Cheese, green leafy vegetables, tomato, all berries, rice radish, lentils, coconut, egg yolk	Hear cramps, loss of hair & teeth, low indigestion, de-arrangement of fluid levels in the body.
Boron	Helps to regulate the body's use of calcium, phosphorus, and magnesium. Controls cell growth. Prevents abnormalities in growth	Apple, pear, carrots	Tumours, cysts and other abnormalities
Chromium	Essential for metabolism of	Betel leaves, areca	Impairment of

	carbohydrates and fats. Increases effectiveness of insulin	nut, nuts	glucose tolerance, protein, energy malnutrition
Sodium	Maintains acid base equilibriums, in transmitting nerve impulses, in relaxing muscle, regulates osmotic pressure and maintains water balance in the body	Celery, cucumber, watermelon, lemon, orange, beet tops, cabbage, lettuce, corn, okra, apple, berries, pumpkin, almond, walnut, shellfish, kidney, olive	Chronic diarrhoea, nausea, muscular weakness, heat exhaustion, mental apathy, respiratory failure
Copper	Copper is necessary for the formation of haemoglobin and is required for the function of over 30 proteins, including superoxide dismutase, ceruloplasmin, lysyl oxidase, cytochrome c oxidase, tyrosinase and dopamine-β –hydroxylase.	Molluscs, shell fish, betel leaves, betel nut, almonds, dried beans, pear, lentils, prunes, egg yolk	Weakness of body, digestive disturbances, impaired respiration
Manganese	Manganese is a key component of enzyme systems, including oxygen-handling enzymes. It supports brain function and reproduction and is required for blood sugar regulation. In addition, it is part of bone structure. It aids in the coordination of nerve impulses and muscular action.	Nuts, dried legumes, citrus, fish, raw egg yolk, spinach	Dizziness, poor elasticity of muscles, poor memory
Iodine	Throxine, secreted by thyroid gland, the chief source of iodine, controls the basic metabolism and oxygen consumption of tissues, utilization of sugars, regulates the rate of energy production & body weight and promotes growth	Iodized salt, sea foods, spinach, turnip greens, garlic, pineapple, artichokes, fish liver oils	Goitre, cretinism in children, myxoedema in adults, low blood pressure
Fluorine	Essential for healthy teeth. It is a germicide and acts as an antidote to poison, sickness and diseases	Goats milk, cauliflower, garlic, watercress, beet, cabbage, spinach, pistachio nuts	Dental carries

Cobalt	A component of vitamin B_{12}, necessary for the formation of RBC	Meat, kidney, liver	--
Zinc	Zinc is a pervasive microelement that plays a catalytic or a structural role in more than 200 enzymes (e.g. carboxypeptidase, liver alcohol dehydrogenase and carbonic anhydrase) involved in digestion, metabolism, reproduction, and wound healing. It guards against disease and infection & transports vitamin A to retina	Milk, liver, beans, meat, whole grains, nuts, seeds	Anamia, weight loss, loss of hair, diarrhoea, poor appetite, skin diseases
Selenium	Aids in maintaining youthful elasticity in tissues, prevents or slows down ageing process and hardening of tissue	Brewer's yeast, garlic, onion, tomato, egg yolk, milk, sea food	Cancer, cardiovascular disease, inflammatory diseases, premature ageing, cataract formation
Silicon	Essential for growth of skin, hair shafts, nails and other outer coverings of the body. It also makes the eyes bright and assists in hardening the enamel of the teeth. Beneficial in all healing processes and protects the body against diseases such as tuberculosis and skin disorders	Apple, cherries, grapes, asparagus, beets, onions, almond, honey, pea nuts, juices of green leaves	Soft brittle nails, wrinkles, loss of hair, poor bone development, insomnia, osteoporosis
Molybdenum	Essential for synthesis of haemoglobin and absorption of iron. Aids in carbohydrate and fat metabolisms	Whole grain, pulses, legumes, leafy vegetables, nut	Dental carries, sulphite sensitivities

Enzymes and health

Enzymes are proteins that act as a catalyst in biochemical reactions. These are part of all living cells including those of plants and animals. Enzyme activity is influenced by substrate concentration, by temperature and pH within a certain range. They are absolutely specific in their actions. A particular enzyme can cause reactions involving a particular type of substance or goup of closely related substances. The substance on

which the enzyme acts is known as 'substrate'. The six main group of enzymes are oxide-reductase, transferase, hydrolases, lyases, isomerise and ligases.

Fruit enzymes: Fruits like papaya, kiwifruit, pineapple and figs all contain enzymes called proteases. Proteases speed up the breakdown of proteins. Papain from papaya, actinidin from kiwi fruit, bromelain from pineapple and ficin from fig are used for dietary supplements.

Chemical digestion of carbohydrates, fats and proteins by different enzymes are given below (4).

Table 4. Chemical digestion of carbohydrates, fats and proteins by different enzymes

Source of enzyme	Enzyme	Substrate	Products
Salivary glands	Ptyalin	Starch	Dextrins and maltose
Stomach	Pepsin	Protein	Polypeptides
	Rennin	Casein	Insoluble casein
	Gastric lipase	Triglycerides	Glycerol
Pancreas	Protease, trypsin, chymotrypsin	Proteins and polypeptides	Smaller polypeptides, aminoacids
	Lipase	Fats	Mono and diglycerides, fatty acids and glycerol
	Amylase	Amylose and Amylopectin	Maltose
Intestine	Peptidase, aminopeptidases, dipeptidases	Polypeptides, dipeptides	Smaller polypeptides, aminoacids
	Isomaltase	Dextrins	Glucose
	Sucrase	Sucrose	Glucose and fructose
	Maltase	Maltose	Glucose
	Lactase	Lactose	Glucose and galactose

Proteins and health

Proteins are complex organic compounds which comprises of carbon, hydrogen, oxygen, nitrogen and also contains sulphur. Protein molecules consist of one or several long chains of amino acids linked in a characteristic symptoms. Proteins may be classified into globular proteins and fibrous proteins. Globular proteins are water soluble such as enzymes, antibodies, haemoglobin, albumin and insulin. Fibrous proteins are insoluble in water and consist of long coiled strands, e.g., keratin, collagen, actin, myosin and fibrin. Therefore, proteins are vital substances which form constituents of muscles,

tissues, and the blood. Proteins supply the building materials for the body and make good the wear and tear of tissues. Amino acids are building blocks of protein, water soluble organic compounds that posses both a carboxylic group (-COOH) and an amino ($-NH_2$) group attached to the alpha carbon atom. There are about 22 amino acids needed for the normal functioning of the body. The amino acids that the body can not synthesize in adequate quantities are called essential amino acids, e.g., isoleucine, leucine, histidine, lysine, methionine, phenyl alanine, threonine, tryptophan, valine and non-essential amino acids are those that body can synthesize in sufficient amounts to meet its needs, e.g. alanine, arginine, asparagine, aspartic acid, cysteine, cystine, glutamic acid, glutamine, glycine, hydroxyproline, proline, serine and tyrosine (Plummer, 1990).

Functions, sources and deficiency symptoms of different amino acids are given below.

Tryptophan: It is essential for blood clotting, digestive juices and optical systems. Tryptophan prevents premature ageing, cataracts, baldness and malformation of teeth enamel. It improves female reproductive systems and aids in utilization of vitamin A. This is an effective food remedy for insomnia and pain. Seeds, nuts and most vegetables are major sources of trptophan. Deficiency of tryptophan causes night blindness, cataract and poor vision.

Methionine: A sulphur containing amino acid which helps to dissolve cholesterol and assimilate fat. It is needed by the haemoglobin, the pancreas, the lymph and the spleen. It helps to maintain proper nitrogen balance in the body. Brazil nut, hazel nut, Brussel sprouts, cabbage, cauliflower, pineapple and apple are rich sources of methionine. Lack of methionine causes rheumatic fever, cirrhosis and nephritis of the kidneys.

Lysine: Along with vitamin C, vitamin A and zinc it helps to eliminate virus infections. It is a natural remedy for cold, sores, shingles and genital herpes. Lysine also affects female reproductive systems. Deficiency of lysine causes headaches, dizziness, nausea and anaemia. Nuts, seeds, vegetables and fruits are major sources of lysine.

Valine: It is an important growth factor for mammary glands and ovaries. It is essential for prevention of nervous and digestive disorders. Almonds, apples and most vegetables are sources of valine. A person deficient of this amino acid is sensitive to touch and sound.

Isoleucine: It maintains the nitrogen balance for all body functions. It also regulates metabolism of the thymus, spleen and pituitary glands. Nuts and sunflower seeds are rich sources of isoleucine.

Phenylalanine: It is essential for production of adrenaline, thyroid secretion, the hair and the skin pigment, melanin. It is effective for controlling of weight and functioning of kidney and bladder.seeds, carrots, parsley and tomatoes are major sources of phenylalanine.

Threonine: It is effective for brain development of children and convulsion.

Histidine: It is helpful for normal growth and repair and blood supply. It is essential for formation of glycogen in the liver. Root vegetables, and all green vegetables are rich sources of histidine. Lack of histidine causes orthopaedic and joint pains.

Arginine: It is required for all male reproductive cells. Found in green and root vegetables.

Cystine: It is essential for for proper formation of skin and helps one recover from surgery. It promotes the formation of carolene which helps hair growth. It is used in the treatment of skin disease, for white blood cell counts and anaemia.

Tyrosine: It is a useful amino acid for stress, depression, nervousness, irritability and despondency. It can be helpful in the treatment of allergies and high blood pressure.

Glutamine: It is considered beneficial in the treatment of alcoholism.

Cystine: It is effective against obesity. Besides, it is anti-cancerous and anti-ageing.

The best food proteins with all the essential amino acids are observed in almonds, cheese and eggs. Most of amino acids are effective against stomach ulcers, burns, kidney disorders and liver diseases.

Dietary fibres and health

The term " dietary fibre consisting of non-digestible carbohydrates and lignin that are intrinsic and intact in plants " Dietary fibre includes very diverse macromolecules exhibiting a large variety of physico-chemical properties. The main components included as fibre are cellulose, hemicelluloses, pectins, lignin, resistant starch and non-digestible oligosaccharides. Fibre rich diet prevent obesity, colon cancer, heart disease, gall stones, irritable bowel syndrome, diverticulosis and diabetic conditions. Major food sources of fibres are wheat, rice, barley, rye, wheat bran, millets, legumes, potato, carrot, beet, turnip, mango, guava, cabbage, lettuce and celery.

Specialty foods for health

Raw juices: Raw juices contain natural medicines, hormones and antibiotics. Raw juice therapy is an effective way to restore health and to rejuvenate the body. Fruit and vegetable juices can be classified into six main categories. These are juices from sweet fruits such prunes and grapes; juices from sub-acid fruits like apple, plum, peach, apricot and cherry; juices from acid fruits like apple, orange, lemon, grapefruit, strawberry and pineapple; juices fruited vegetables namely tomato, bitter gourd and cucumber; juices from leafy vegetables like cabbage, celery, lettuce, spinach, parsley and watercress and juices from root and tuberous vegetables like beetroot, carrot, onion, potato and radish. Usually, fruit juices stir up toxins and acids in the body and therefore,

stimulating the eliminative processes. Vegetables juices sooth the nerves and work in mild manner. It is suggested to use juices individually.

- Juices from sweet fruits can be combined with juices of sub-acid fruits
- Juices from sub-acid fruits can be combined with juices fruit sweet or acid fruits
- Juices from acid fruits may be combined with sub-acid fruits of fruited vegetables
- Juices from fruited vegetables may be combined with acid fruits or green leafy vegetables
- Juices from green leafy vegetables can be may be combined with fruited or root vegetables
- Juices from root vegetables may be combined with green leafy vegetables

Sprouted foods: These foods supply all kinds of essential vitamins and minerals. They form a vital component of our diet. All edible grains, seeds and legumes can be used as sprouted foods.

- Grains: Wheat, maize, ragi, bajra and barley
- Seeds : Alfalfa, seeds, radish seeds, fenugreek seeds, carroe seeds, coriander seeds, pumpkin seeds and muskmelon seeds
- Legumes: Mung, Bengal gram, groundnut, peas

Sprouted foods contain easily digestible carbohydrates, proteins, vitamins like ascorbic acid and minerals sodium. They supply food in predigested form. Sprouted foods contain lot of fibre and water and are helpful in overcoming constipation.

Raw foods as salad: Prolonged cooking of natural foods led to destruction of most of their essential nutrients needed for the maintenance of good health. Raw foods differ in nature from cooked foods and they have certain advantage. They play vital role for normal functioning of the body, balancing the body chemistry, have the strong anti-oxidant effects and curative power to sustain health.

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