YBBN University, Ranchi

Mineral Salts:

At the end of this unit, students will be able to: ƒ Define minerals ƒ Describe the functions of minerals ƒ Understand the sources of minerals ƒ Identify the deficiency of minerals ƒ Explain the importance of water Definition Minerals: are inorganic elements occurring in nature. They are inorganic because they do not originate in animal or plant life but rather from the earth's crust. Although minerals make up only a small portion of body tissues, they are essential for growth and normal functioning of the body. The body can make most of the things it needs from energy foods and the amino acids in proteins but it cannot make vitamins and minerals. Benefits of minerals ƒ Minerals are essentials both as structural components and in many vital processes, ƒ some form hard tissues such as bones and teeth ƒ some are in fluids and soft tissues.

For normal muscular activity the ratio between potassium and calcium in the extra cellular fluid is important. ƒ Electrolytes, sodium and potassium are the most important factors in the osmotic control of water metabolism ƒ Some minerals may act as catalysts in the enzyme system, or as integral parts of organic compounds in the body such as: ¾ Iron in hemoglobin ¾ Iodine in thyroxin ¾ Cobalt in vitamin B12. ¾ Zinc in insulin and ¾ Sulfur in thiamine. Plants, animals, bacteria, and other one celled organisms all require proper concentration of certain minerals to make life possible. The principal minerals, which the body requires. Calcium Chlorine Iron Phosphorus Sodium Iodine Magnesium Potassium Sulfur Animals, in trace quantities, use minerals and these are: Copper, Manganese, Cobalt, Zinc, and Fluorine. Other trace elements are present in animal tissues, but their functions are uncertain and these are Aluminum, Arsenic, Boron, Cadmium, and Silicon. In natural foods, minerals present in various forms mixed or combined with:

Protein

Fats and ƒ Carbohydrate Iron Sources of Iron ƒ Beef, liver, egg yolk ƒ Wheat and Teff ƒ Dark green vegetables, onions & fresh fruits. Daily requirements for men and women are 8 to 10mg and 10 to 18 mg respectively. For pregnant and lactating mother the requirement increases to 20mg. Absorption of iron is enhanced in the presence of vitamin C. Functions of Iron It is an essential component of hemoglobin, responsible for the red coloring of blood and for the transportation of oxygen to the tissues. Causes of Iron Deficiency ƒ Insufficient iron in diet ƒ Blood loss during menstruation ƒ Hook worm infestation.

Causes of anemia are multiple and the main causes are nutritional deficiencies, which represent more than half of all cases, blood loss through hemorrhage, destruction of red blood cells by infections such as malaria and parasitic infections, genetic defects of red blood cells and infections by most of febrile diseases and chronic diseases like tuberculoses. Consequences of anemia ƒ Delayed psychomotor development and cognitive performance in children and adolescence. ƒ Neurological manifestation in children and adolescents. ƒ In adults, anemia with hemoglobin concentration reduces work capacity, mental performance and tolerance to infections. ƒ When the level of hemoglobin concentration falls below 4g/ld it may cause death from anemic heart failure. ƒ can also cause increased maternal mortality due to adverse immune reaction, ƒ Maternal anemia can cause prenatal infant loss, low birth weight and prematurity, ƒ Prenatal deaths ƒ Reduces **work capacity in adults and learning ability in children**

Strategies for prevention and treatment of iron deficiency

Supplementation of iron tablets (with folates) preferably with vitamin B12 and vitamin C ƒ Dietary improvement of iron rich foods ƒ Changing of dietary habits and food preparation practices through nutrition education ƒ Fortification of foods with iron ƒ Control of malaria infection ƒ Control of febrile and chronic diseases, ƒ Promotion of hygiene and sanitation, ƒ Education, information and communication on iron supplementation, ƒ Networking and collaborating with relevant sectors on issue, Who needs more iron? ƒ pregnant women require much higher amount of iron than is met by most diets. ƒ many infants beyond 6 months of age need more iron than is available in breast milk and common weaning foods. ƒ Infants with low birth weight have less iron stores, and are thus at a higher risk for deficiency after two months of age. Therefore, it is important that pregnant women routinely receive iron supplements. In places where anemia prevalence is high,

Supplementation should continue into the postpartum period, to enable them acquire adequate stores of iron. Iodine Iodine is one of the micronutrients, which is highly essential for regulation of physical growth and neural developments. Iodine is an essential component of the thyroid hormones, thyroxin. Failure to have adequate level of iodine in the blood leads to insufficient production of these hormones, which affect many different parts of the body, particularly muscle, liver, kidney, and the developing brain. Sources of Iodine ƒ Milk and sea food ƒ Drinking water ƒ Plant source depends on whether or not iodine present in the soil ƒ Iodized salt Functions of

Iodine *f* It is required for normal physical and mental growth. *f* It is required by the thyroid gland for the production of thyroxin, which regulates the metabolic rate. Iodine is naturally found in the top soil, most of the areas in Ethiopia especially in the high lands, the top soil is eroded with deforestation,

soil erosion and flooding,

thus the crop we grow for food do not have iodine in them and as a result leads to iodine deficiency. People of all ages and sexes are vulnerable but become acute in fetus, children, pregnant women and lactating mothers. Livestock suffer from iodine deficiency in the same way that humans do. They eat the same iodine deficient food and drink the same iodine deficient water. The introduction of iodized salt in their diet will improve their health and productivity; livestock fed iodized salt will produce iodine rich milk and meat. An iodine deficient diet will lead to increased stillbirth and miscarriages and a reduced yield of milk, eggs, meat and wool. How do we prevent Iodine Deficiency Disorder? Iodine Deficiency Disorder can be eliminated by the daily consumption of iodized salt. That is why Universal Salt Iodization is a crucial mid-decade goal of Ethiopia. Why salt is iodized? Salt has been chosen as vehicle for the supply of iodine because it is used universally by all ages, sexes, socio-economic, cultural and religious groups throughout the year. Iodized salt is also a preventive and corrective measure for iodine deficiency and is the most effective low cost, long-term solution to a major public health problem.