

Lecture 7

MINERALS

The total mineral content of plants or animals is called ash. These are inorganic elements useful to the body in many ways. Like proteins, we cannot make minerals in our body; hence, minerals must be supplied by our feed/food as they are widely distributed in the average diets. They yield no energy but have important roles to play in many activities in the body.

They can be classified as major minerals required in large quantities in the diet these include – Ca, P, Na, Cl and those required in minute quantities called trace/micro minerals e.g. Fe, Cu, Co, K, Mg, I, Zn, Mo, F, Se and S as shown below.

	Names	Function(s)	Deficiency Symptom(s)	Source(s)
i.	Calcium	Ossification of bones and teeth Muscle tone Coagulation of blood Selective cell permeability	Rickets Osteomalacia Enlarged parathyroid	Bones Milk Animal products
ii.	Phosphorus	Ossification of bones and teeth Fat and CHO metabolism Nucleic acid metabolism	Rickets Osteomalacia Retarded growth	Animal products Plant material
iii.	Sodium	Osmotic regulation Electrolyte and water balance Nerve and muscle action	Muscular cramps General weakness Vascular collapse	Common salt Animal products

iv.	Chlorine	Maintains osmotic concentrations Transport of CO ₂ Solubility of proteins Activates salivary amylases	Alkalosis Hyperexcitability	Animal products Common salts
v.	Potassium	Osmotic regulation Enzyme reactions Electrolyte and H ₂ O balance Nerve and muscle action	Slow growth Muscular weakness Hypertrophy of the adrenals	Most ingredients
vi.	Magnesium	Ossification of bone and teeth Enzyme activator Decrease tissue irritability	Nervousness Twitching	Oilseed meals Cereals Bones
vii.	Sulphur	Component of some amino acids and vitamin Component of cartilage	Reduced moth, cyt, thiamine synthesis	Most ingredients
viii.	Iodine	Thyroxine synthesis	Goitre Stillborn births Cretinisms	Sea food Iodized salts
ix.	Iron	Component of Hb and Myoglobin Component of cytochrome and Xanthine oxidase	Anaemia Reduced growth Difficult breathing	Meat Green vegetables
x.	Copper	Increase iron absorption Formation of erythrocytes Component of enzymes	Anaemia De-pigmentation Impaired bone formation	Plant materials

			Impaired reproduction	
xi.	Cobalt	Synthesis of Vit. B ₁₂ Activator of peptidases	Emaciation Macrocytic anaemia	Plant materials
xii.	Manganese	Bone formation Functioning of reproductive system	Defective ovulation Testicular degeneration	Grains and roughage
xiii.	Zinc	Co-factor of enzymes Bone and feathers RNA synthesis	Lesions on epithelium Atrophy of male reproductive organs	Animal products
xiv.	Selenium	Component of enzyme Glutathione peroxidase	Degeneration of pancreas Muscular dystrophy	Feed ingredients
xv.	Fluorine	Prevent dental caries	Enamel density reduction	Drinking water