

MINERALS, LIPIDS, AND AMINO ACIDS

Minerals are **inorganic** (lack carbon) chemical elements that are necessary to the health and maintenance of the body's many biological processes. Minerals are required for almost every single function in the body. They act as catalysts for many essential vitamins. One example is magnesium, which allows calcium and vitamin C to be metabolized and helps to convert blood sugar into energy. Without magnesium, these nutrients would be excreted from the body without ever being used. Another example is iron. Iron is one key to hemoglobin production, which is necessary to transport oxygen throughout the body.

Minerals can be major or trace. Major minerals are those that the body needs in large amounts such as calcium, magnesium, phosphorus, potassium, sodium, and chloride, and trace minerals are those the body needs in minute amounts. Trace minerals include chromium, cobalt, copper, iron, iodine, manganese, molybdenum, selenium, silica, and zinc. Table 21-3 lists both major and trace minerals and their functions.

TABLE 21.3 Minerals

Vitamin	Function	Deficiency	Excess
Major Minerals			
Calcium	Important for: <ul style="list-style-type: none"> • blood clotting • bone and teeth formation • constriction and relaxation of blood vessels • hormone secretion • muscle contraction • nervous system function 	Bone deformities and fractures Leg cramps Tetany Heart dysrhythmias	Constipation Irritation of tissue if IV infiltrates
Magnesium	Important for: <ul style="list-style-type: none"> • blood pressure and blood sugar regulation • bone formation • energy production • hormone secretion • immune function • muscle contraction • nervous system function • normal heart rhythm • protein formation 	Kidney stones and gallstones Endocrine disorders Nerve numbness	None reported
Phosphorus	Important for: <ul style="list-style-type: none"> • acid-base balance • bone formation • energy production and storage • hormone activation 	Malformed bones and teeth Poor growth and healing Fatigue Malabsorption	None reported
Potassium	Important for: <ul style="list-style-type: none"> • blood pressure regulation • cardiac function • carbohydrate metabolism • fluid balance • growth and development • muscle contraction • nervous system function • protein formation 	Confusion Muscular weakness Paralysis Arrhythmias Lethargy Fatigue	Hypotension Listlessness Paralysis Confusion Arrhythmias

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