

TABLE 21.3 Minerals—cont'd

Vitamin	Function	Deficiency	Excess
	<ul style="list-style-type: none"> • energy production • hormone secretion • immune function • muscle contraction • nervous system function • heart function • protein formation 	Weakness in joints; linked to myasthenia gravis Impaired glucose metabolism Reduced insulin production	
Molybdenum	Important for: <ul style="list-style-type: none"> • enzyme production 	Cavities Anemia Impotence Gout Malabsorption	Weight loss Stunted growth Anemia Diarrhea Swollen joints
Selenium	Important for: <ul style="list-style-type: none"> • immune function • reproduction • thyroid function • acts as an antioxidant 	Immune, CV, liver, and sexual disorders	Nausea, vomiting, diarrhea Hair loss Rash Brittle nails Fatigue Nerve damage Garlic odor to breath
Silica	Important for: <ul style="list-style-type: none"> • connective tissue and skeletal tissue functioning 	Hair Skin, CV, and bone disorders	None reported
Zinc	Important for: <ul style="list-style-type: none"> • growth and development • immune and nervous system functions • protein formation • reproduction • taste and smell • wound healing 	Alcohol tolerance Anemia Poor wound healing Decreased taste Hair loss Dermatitis Immune deficiency Growth retardation	Nausea and vomiting, diarrhea Headache

CV, cardiovascular; GI, gastrointestinal.

Amino acids are compounds that contain an amino group and have an acidic function. They are considered the building blocks of protein. The eight “essential” amino acids include alanine, valine, tryptophan, isoleucine, methionine, lysine, threonine, and leucine (Table 21-4). They are called essential because the body can only obtain them through diet and does not store them for future use. In addition, there are 12 “nonessential” amino acids; nonessential means that they can usually be made from other substances in the body if needed.

Lipids (fats) are necessary for life in that they store energy, insulate body tissues from heat and cold, and cushion and protect our internal organs. Saturated fats are obtained from animals and are solid at room temperature. Unsaturated fats originate from plant sources and are liquid at room temperature. Cholesterol is used to synthesize hormones, vitamin D, and bile. It also serves to stabilize cell membranes throughout the body. Fatty acids found in fish are available as fish oil and are considered helpful in patients with high triglycerides or familial history of heart disease, and they may also lower blood pressure. For patients who are receiving all their nutrients through IV therapy, an IV form of lipids (Intralipid 20%) is available to provide essential fatty acids and calories. Lipids are available as oral supplements and are used to lower harmful types of cholesterol, treat poor blood flow, lower the body’s production of triglycerides, and treat wrinkles (Table 21-5).