Table 11.1 Macrominerals: Functions, Body Content, Deficiency Symptoms, and Recommended Dietary Allowances (RDAs) or Adequate Intakes (AIs)

Calcium	Structural component of bones and teeth; role in cellular processes, muscle contraction, blood clotting, enzyme activation	1,400 g	Adenylate, cyclase, kinases, protein kinase, Ca^{2+}-Mg^{2+} ATPase (others, see Table 11.3)	Rickets, osteomalacia, osteoporosis, tetany	Milk, milk products, sardines, clams, oysters, turnip and mustard greens, broccoli, legumes, dried fruits	1,000 mg*, 19–50 years
Chloride	Primary anion; maintains pH balance, enzyme activation, component of gastric hydrochloric acid	105 g		In infants: loss of appetite, failure to thrive, weakness, lethargy, severe hypokalemia, metabolic acidosis	Table salt, seafood, milk, meat, eggs	
Magnesium	Component of bones; role in nerve impulse transmission, protein synthesis; enzyme cofactor	35 g	Hydrolysis and transfer of phosphate groups by phosphokinase; important in numerous ATP-dependant enzyme reactions	Neuromuscular hyperexcitability, muscle weakness, tetany	Nuts, legumes, whole-grain cereals, leafy green vegetables	400 mg males; 310 mg, females; 19–30 years
Phosphorus	Structural component of bone, teeth, cell membranes, phospholipids, nucleic acids, nucleotide coenzymes, ATP-ADP phosphate transferring system in cells, pH regulation	850 g	Activates many enzymes in phosphorylation and dephosphorylation	Neuromuscular, skeletal, hematologic, and cardiac manifestations; rickets, osteomalacia	Meat, poultry, fish, eggs, milk, milk products, nuts, legumes, grains, cereals	700 mg, 19+ years
Potassium	Water, electrolyte, and pH balances; cell membrane transfer	245 g	Pyruvate kinase, Na^+/K^+-ATPase	Muscular weakness, mental apathy, cardiac arrhythmias, paralysis, bone fragility	Avocado, banana, dried fruits, orange, peach, potatoes, dried beans, tomato, wheat bran, dairy products, eggs	Not established
Sodium	Water, pH, and electrolyte regulation; nerve transmission, muscle contraction	105 g	Na^+/K^+-ATPase	Anorexia, nausea, muscle atrophy, poor growth, weight loss	Table salt, meat, seafood, cheese, milk, bread, vegetables (abundant in most foods except fruits)	Not established
Sulfur	Component of sulfur-containing amino acids, lipoic acid, and 2 vitamins (thiamin, biotin)	175 g		Unknown	Protein foods—meat, poultry, fish, eggs, milk, cheese, legumes, nuts	Not established

Note: Abbreviations: ATP, adenosine triphosphate; ADP, adenosine diphosphate.

* Adequate intake.