Minerals

1. Introduction (Page 306 - 309)

A. Classification

i. Major Minerals 100 mg / day or more

ii. Minor Minerals are less than 100 mg / day

ii. Questionable Minerals

Major Minerals *(>100 mg/day)*		**Minor Minerals** *(<100 mg/day)*		**Questionable**	
Calcium	(Ca)	Iron	(Fe)	Silicon	(Si)
Phosphorus	(P)	Iodine	(I)	Vanadium	(V)
Magnesium	(Ng)	Zinc	(Zn)	Nickel	(Ni)
Sodium	(Na)	Copper	(Cu)	Tin	(Sn)
Potassium	(K)	Manganese	(Mn)	Cadmium	(Cd)
Chloride	(Cl)	Chromium	(Cr)	Arsenic	(As)
Sulfur	(S)	Cobalt	(Co)	Aluminum	(Al)
		Selenium	(Se)	Boron	(B)
		Molybdenum	(Mo)		
		Fluoride	(F)		

B. Mineral Characteristics and Issues

i. Chemical Nature

ii. Bioavailability

iii. Fiber Interactions

iv. Mineral-Mineral Interactions

a. Competition

v. Vitamin-Mineral Interactions

a. Vitamin D and Calcium

vi. Toxicity

4. Calcium (Pages 310 - 317)

A. Intake

B. Sources (Page 312 - 313)

i. Dairy

ii. Plant Foods

a. Bioavailability

- Phytic Acid
- Oxalic Acid

iii. Supplements (Page 314 - 315)

C. RDA (Page 315)

D. Effects on Absorption of Calcium

i. Acidity

ii. Vitamin D

iii. Physiological State

iv. Composition of Diet

a. Fat

b. High Protein Diet

E. Calcium Control (Page 310 - 312)

- See handout on Calcium Control

F. Calcium and Bone Maintenance

G. Clinical Problems

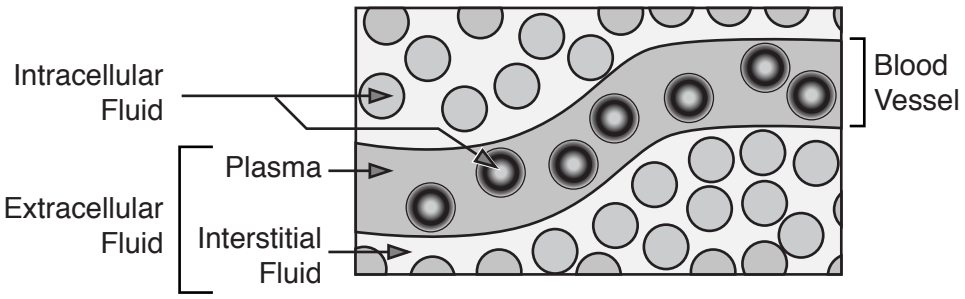
i. Osteoporosis (Page 315 - 317)

ii. Hypercalcemia

5. Sodium - (Pages 318 - 322)

A. Water Balance and Sodium and Potassium

i. Body Fluids



ii. Osmosis

iii. Sodium and Potassium and Water Adjustment

- See Handout on Sodium and Potassium

iv. Diet and Water Adjustment

a. Sodium Sensitivity

B. Sodium and Hypertension (320 - 322)

i. Heart Pressures

a. Systolic

b. Diastolic

Blood Pressures

	Systolic	***Diastolic***
Normal	<120	<80
Prehypertension	120 to 139	80 to 89
Hypertension	≥140	≥90

Soure: Nutrition for healthy Living, 3erd edition, by Windy J. Schiff

C. Atherosclerosis and Hypertension (320 - 321)

D. Obesity and Hypertension (320 - 321)

E. Requirements

i. AI = 1500 mg / day - although 180 would do fine.

ii. UL = 2300 mg / day b - average American over 3000 mg / day

6. Potassium (Pages 323 - 325)

    A. Function: Intracellular fluid Maintenance and Regulation

    B. Sources

7. Magnesium (Pages 325 - 327)

8. Iron (Pages 328 - 334)

    A. Forms

        i. Heme

        ii. Nonheme

    B. Absorption

        i. Effect of Dietary Fiber

        ii. Coffee and Tea

        ii. Calcium Supplement

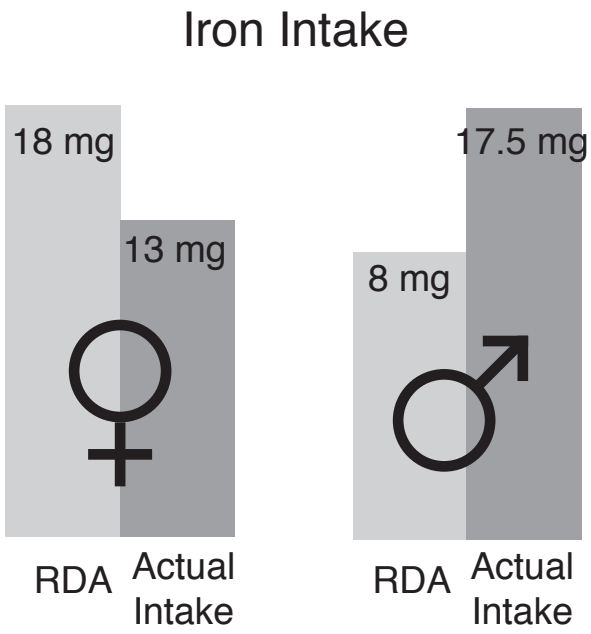
            a. Tannins

C. Storage and Transport (Page 330; see also Handout on Iron Transport)

i. Ferritin

ii. Transferrin

D. Requirements and Actual Intake (Page 330)



E. Deficiency Disorders 9 Pages 331 - 333)

i. Anemia

a. Blood Lose

b. Diet Inadequacies

c. Milk

d. Vegetarians

F. Iron Toxicity

9. Zinc

   A. Function

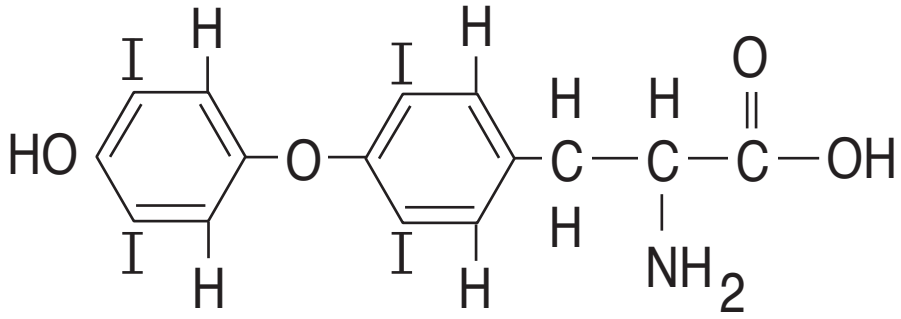
   B. Sources

   C. Deficiencies

   D. Requirements – RDA 8 mg / day to 11 mg / day

   E. Toxicity – UL is 40 mg / day

10. Iodine



   A. Absorption

   B. Iodine Deficiency

   C. Sources

Periodic Table

Shaded elements are of particular nutritional significance to health

1 H 1																	2 He 2
7 Li 3	8 Be 4											11 B 5	12 C 6	14 N 7	16 O 8	19 F 9	20 Ne 10
23 Na 11	24 Mg 12											27 Al 13	28 Si 14	31 P 15	32 S 16	35 Cl 17	40 Ar 18
39 K 19	40 Ca 20	45 Sc 21	48 Ti 22	51 V 23	52 Cr 24	55 Mn 25	56 Fe 26	59 Co 27	59 Ni 28	64 Cu 29	65 Zn 30	70 Ga 31	73 Ge 32	75 As 33	79 Se 34	80 Br 35	84 Kr 36
85 Rb 37	88 Sr 38	89 Y 39	91 Zr 40	93 Nb 41	96 Mo 42	97 Tc 43	101 Ru 44	103 Rh 45	106 Pb 46	108 Ag 47	112 Cd 48	115 In 49	119 Sn 50	122 Sb 51	128 Te 52	127 I 53	131 Xe 54
132 Cs 55	137 Ba 56		179 Hf 72	181 Ta 73	184 W 74	186 Re 75	190 Os 76	192 Ir 77	195 Pt 78	197 Au 79	201 Hg 80	204 Ti 81	207 Pb 82	209 Bi 83	209 Po 84	210 At 85	222 Rn 86
223 Fr 87	226 Ra 88																

Macrominerals

Calcium (Ca)
Magnesium (Mg)
Sodium (Na)
Potassium (K)
Chlorine (Cl)
Sulfur (S)

Questionable

Fluorine (F)
Silicon (Si)
Nickel (Ni)
Tin (Sn)
Arsenic (As)
Vanadium (V)
Boron (B)
Cadmium (Cd)
Aluminum (Al)

Trace Minerals

Iron (Fe)
Zinc (Zn)
Selenium (Se)
Manganese (Mn)
Iodine (I)
Copper (Cu)
Molybdenum (Mo)
Chromium (Cr)
Cobalt (Co)

Toxic Metals

Cadmium (Cd)
Lead (Pb)
Mercury (Hg)
Silver (Ag)
Gold (Au)

Mineral Angatonists

Some minerals can compete with other minerals for absorption, excretion, or simply interfere with normal functionality. We call such minerals, "mineral antagonists". In terms of nutrition, this can become a problem when one takes a supplement, "just to be on the safe side," not realizing that it could cause deficiency problems. Below are several mineral antagonists that effect the absorption of the associated minerals listed. This is a partial list. Clearly, there is no substitute for a well balanced diet; and use of supplements needs to done

Ca	**Fe**	**P**	**Mn**	**F**	**Co**	**Mg**	**Zn**	**I**	**Sn**	**Na**	**Cu**	**F**	S
P	Mn	Ca	Cu	Al	Fe	Ca	Fe	Co	Fe	K	S	Al	Se
Al	Cu	Mg	P	Ca		P	Ca		Cu		Ag	Ca	Zn
Zn	Co	Mn	Fe	Mg			Cu				Cu	Mg	
Mg	Mn		Co				Pb				Fe		
	Zn		Mg				Cd				Mo		
											P		
											Cd		
											Zn		
											Pb		
											Se		