

Nutrition 102 – Class 5

Angel Woolever, RD, CD

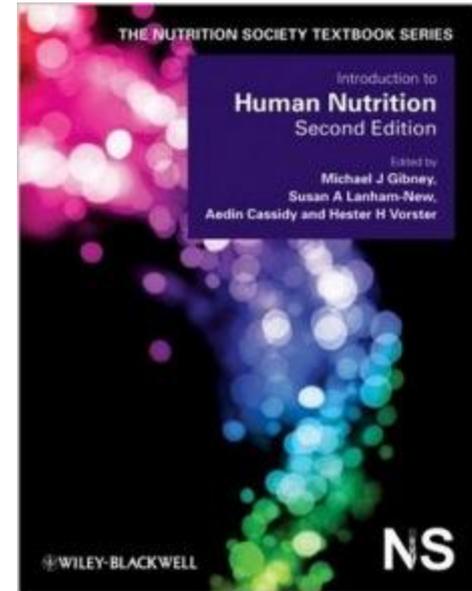


Nutrition 102

“Introduction to Human Nutrition” second edition

Edited by Michael J. Gibney, Susan A. Lanham-New, Aedin Cassidy, and Hester H. Vorster

May be purchased online
but is not required for
the class.



Technical Difficulties

Contact:

Erin Deichman

574.753.1706

edeichman@logansportmemorial.org



Questions

- You may raise your hand and type your question.
- All questions will be answered at the end of the webinar to save time.



Review from Last Week

❏ Minerals: Calcium, Magnesium, Phosphorus, Sodium and Chloride, Potassium, Iron

❏ What they are

❏ Source

❏ Function

❏ Requirement

❏ Absorption

❏ Deficiency

❏ Toxicity



Priorities for Today's Session

Trace Minerals: Zinc, Copper, Selenium, Iodine, Manganese, Molybdenum, Fluoride, Chromium

What they are

Function

Source

Requirement

Absorption

Deficiency

Toxicity



What Is Zinc

Trace Element



Zinc Functions

- Immune system
- Cell division
- Cell growth
- Wound healing
- Breakdown of carbohydrates
- Smell and taste



Zinc Sources

 Meat

 Seafood

 Oysters

 Liver



RDA for Zinc

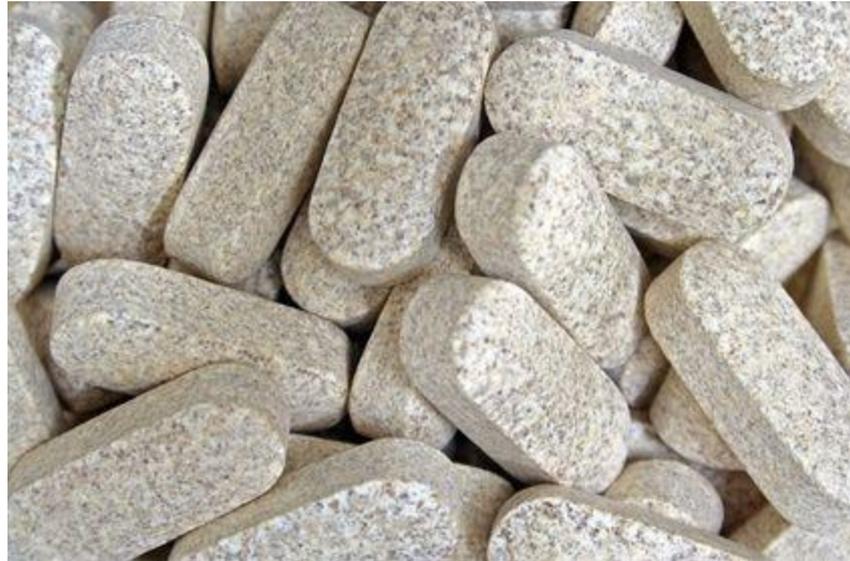
Age	Male	Female	Pregnancy	Lactation
Birth to 6 months	2 mg*	2 mg*		
7 months to 3 years	3 mg	3 mg		
4 to 8 years	5 mg	5 mg		
9 to 13 years	8 mg	8 mg		
14 to 18 years	11 mg	9 mg	13 mg	14 mg
19+ years	11 mg	8 mg	11 mg	12 mg

Zinc Deficiency

- ❏ Frequent infections
- ❏ Hypogonadism in males
- ❏ Loss of hair
- ❏ Poor appetite
- ❏ Problems with sense of taste and smell
- ❏ Skin sores
- ❏ Slow growth
- ❏ Trouble seeing in the dark
- ❏ Poor wound healing

Zinc Toxicity

- ❖ Impaired copper and iron metabolism
- ❖ Impaired immune response
- ❖ Decline in HDL-cholesterol



Zinc Review

 Function

 Source

 Requirement

 Deficiency

 Toxicity



What Is Copper



Copper Functions

- Immune system
- Nervous system
- Cardiovascular system
- Bone health
- Iron metabolism
- RBC formation



Copper Sources



RDA for Copper

Life Stage	Age	mcg/day
Infants	0 – 6 months	200 (AI)
Infants	7 – 12 months	220 (AI)
Children	1 – 3 years	340
Children	4 – 8 years	440
Children	9 – 13 years	700
Adolescents	14 – 18 years	890
Adults	19 years and older	900
Pregnancy	All ages	1,000
Breastfeeding	All ages	1,300

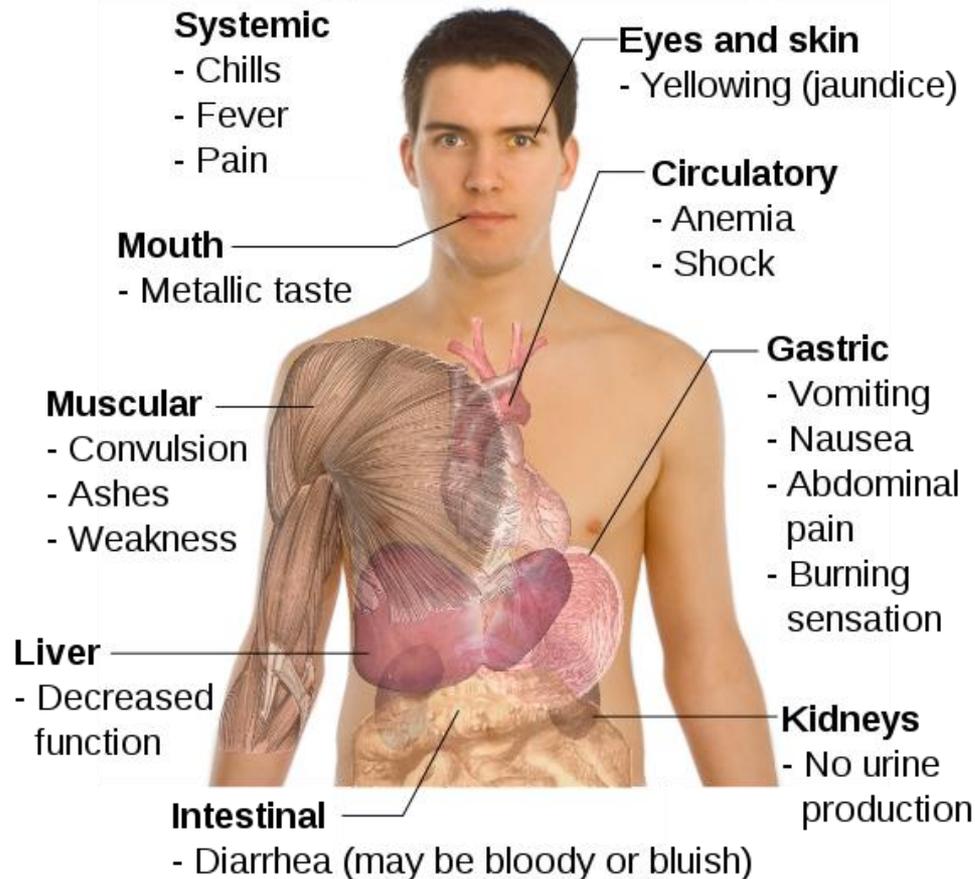
Copper Deficiency

- ❖ Anemia
- ❖ Neutropenia
- ❖ Hypo-pigmentation
- ❖ Impaired growth
- ❖ Neurological symptoms



Copper Toxicity

Main symptoms of Copper poisoning



Copper Review

 Function

 Source

 Requirement

 Deficiency

 Toxicity



What Is Selenium



Selenium

Selenium Functions

- Anti-cancer
- Anti-aging
- Boosts immunity
- Improves brain function
- Anti-heart disease and anti-diabetes
- Selenoenzymes, thyroid regulation
- Anti-viral
- Improves fertility
- Anti-asthma, arthritis, muscular dystrophy, cystic fibrosis



Selenium Sources



Selenium Recommendations

Table 2: Recommended Dietary Allowances (RDA) for Selenium for Children and Adults [12]

Age (years)	Males and Females (mcg/day)	Pregnancy (mcg/day)	Lactation (mcg/day)
1-3	20	N/A	N/A
4-8	30	N/A	N/A
9-13	40	N/A	N/A
14-18	55	60	70
19+	55	60	70

Selenium Deficiency

 Keshan's disease

 Kashin-Beck disease

 Myxedematous Endemic Cretinism

Selenium Toxicity

Selenosis



Selenium Review

 Function

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 Toxicity



What Is Iodine



Iodine Functions

 Metabolism

 Thyroid function



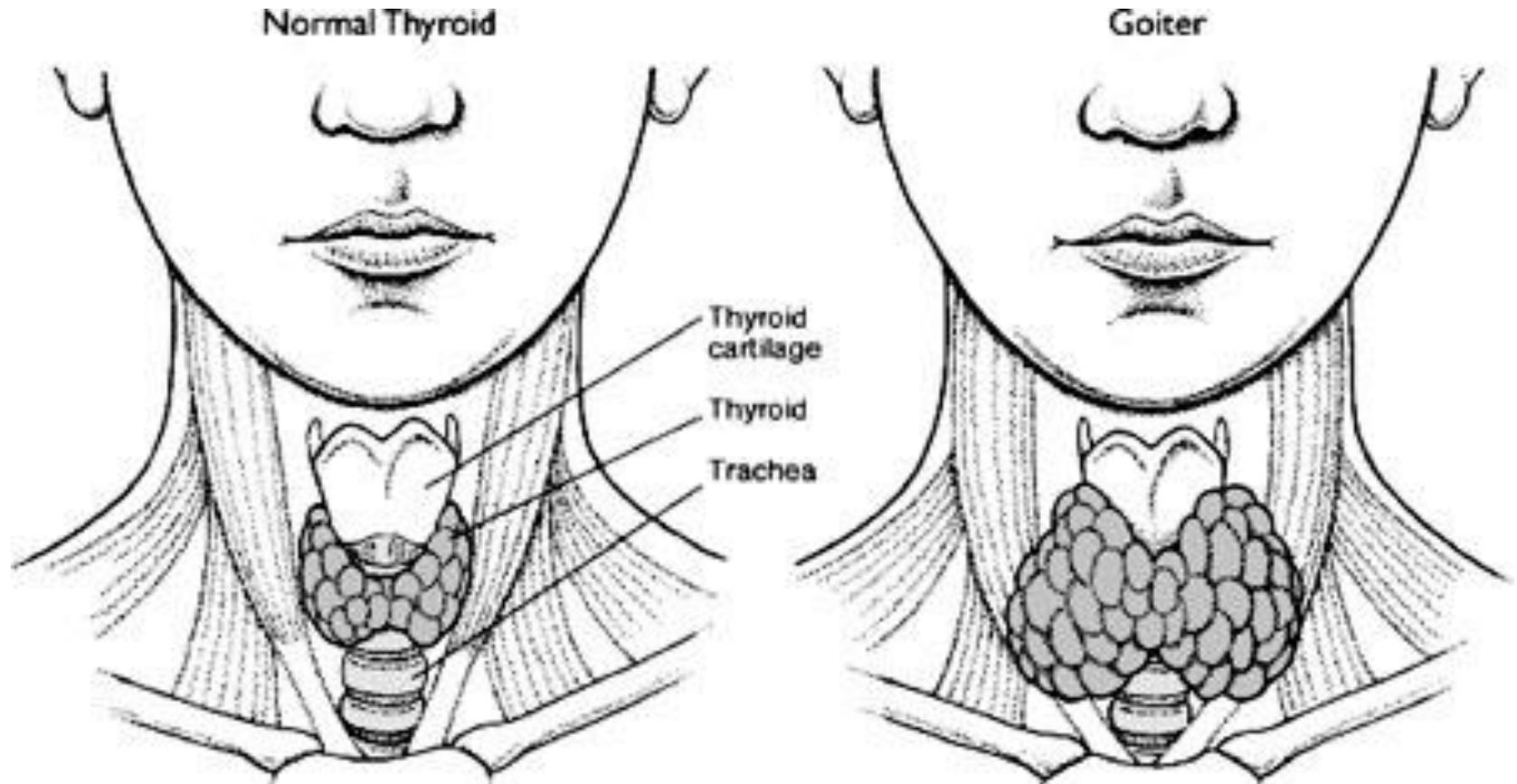
Iodine Sources



Iodine Recommendations

Recommended Dietary Allowance (RDA) for Iodine			
Life Stage	Age	Males (mcg/day)	Females (mcg/day)
Infants	0-6 months	110 (AI)	110 (AI)
Infants	7-12 months	130 (AI)	130 (AI)
Children	1-3 years	90	90
Children	4-8 years	90	90
Children	9-13 years	120	120
Adolescents	14-18 years	150	150
Adults	19 years and older	150	150
Pregnancy	all ages	-	220
Breast-feeding	all ages	-	290

Iodine Deficiency



Iodine Toxicity

• **Hyperthyroidism** → rapid heart rate, trembling, excessive sweating, lack of sleep, and loss of weight and strength

• **Iodine Sensitivity** → mild skin symptoms

Iodine Review

 Function

 Source

 Recommendations

 Deficiency

 Toxicity



What Is Manganese



Manganese Functions

- Connective tissue and bone formation
- Carbohydrate and fat metabolism
- Calcium absorption
- Antioxidant enzyme superoxide dismutase



Manganese Sources



Manganese Requirements

Daily Intake of Manganese to Meet Basic Needs	
Life Stage and Gender	Amount
Birth to 6 months	0.003 mg
Infants 7 to 12 months	0.6 mg
Children 1 to 3 years	1.2 mg
Children 4 to 8 years	1.5 mg
Children 9 to 13 years	1.6 mg (girls)
	1.9 mg (boys)
Teens 14 to 18 years	1.8 mg (girls)
	2.2 mg (boys)
Adults	1.8 mg (women)
	2.3 mg (men)
Pregnant teens and women	2.0 mg
Breastfeeding teens and women	2.6 mg
Source: Institute of Medicine.	

Manganese Deficiency



Manganese Toxicity

- ❏ “Manganic Madness” → result of inhalation
- ❏ Pyschosis, hallucinations, and extrapyramidal damage with features of parkinsonism



Manganese Review

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What Is Molybdenum



Molybdenum Functions

 Processing nitrogen

 Amino acid metabolism

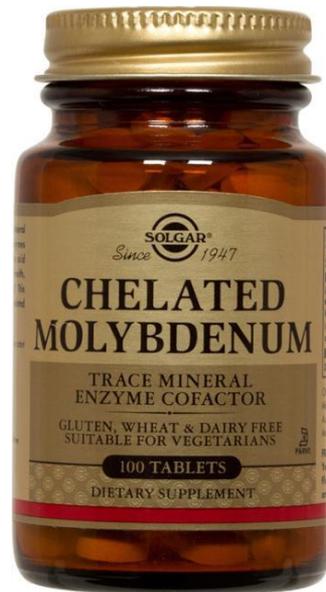


Molybdenum Sources



Molybdenum Requirements

45 mcg/day for adults



Molybdenum Deficiency

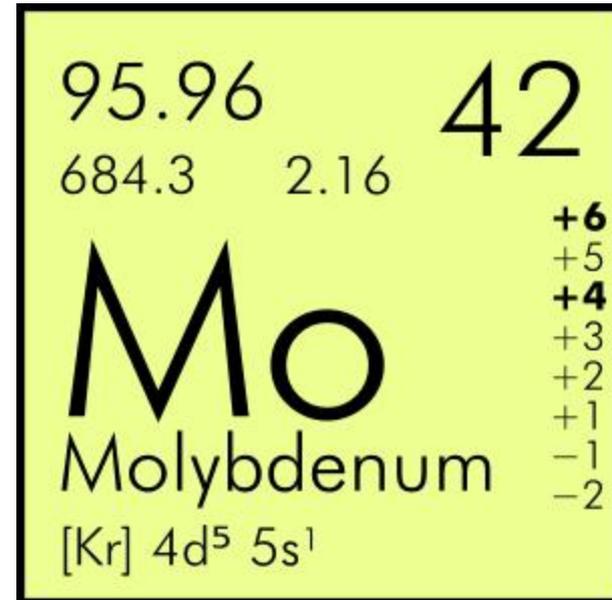
- ❏ Mental retardation
- ❏ Seizures
- ❏ Increased heartbeat
- ❏ Headache
- ❏ Nausea
- ❏ Vomiting
- ❏ Coma



Molybdenum Toxicity

 Painful joints

 Liver, kidney,
digestive tract
problems



Molybdenum Review

 Function

 Source

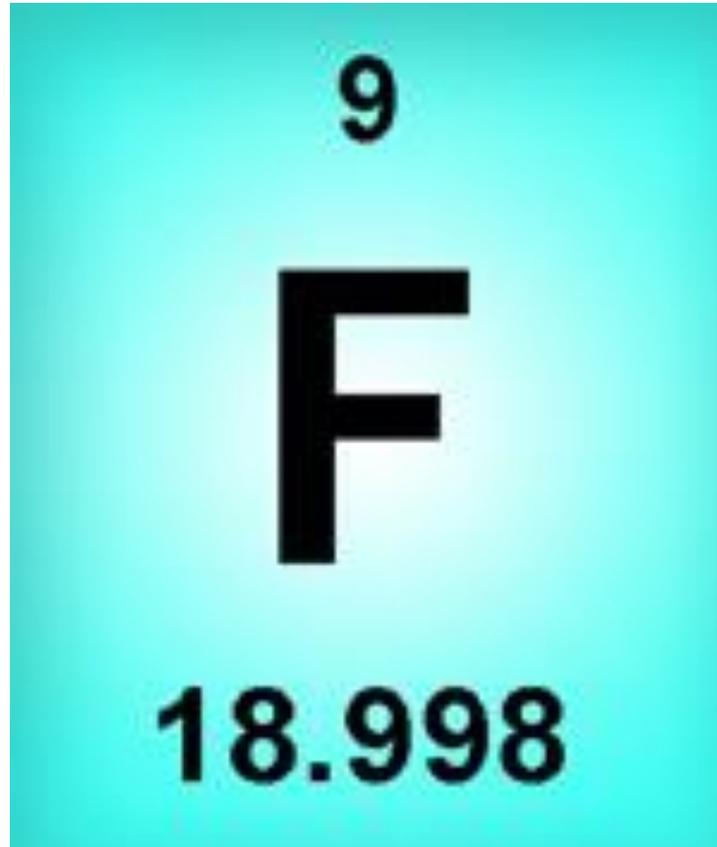
 Recommendations

 Deficiency

 Toxicity



What Is Fluoride



Fluoride Functions

➊ Prevention of dental caries

➋ Stimulates new bone formation



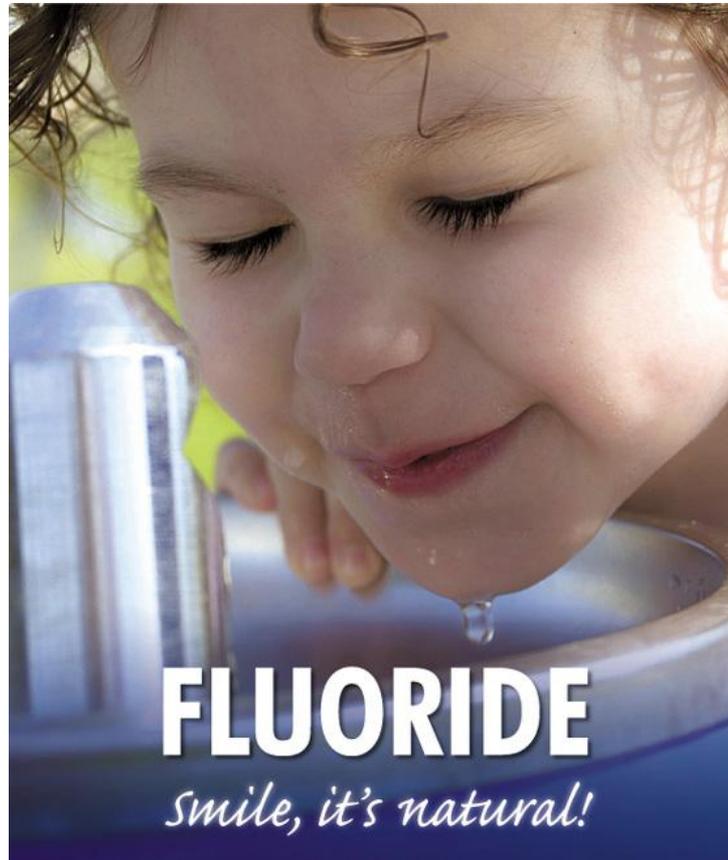
Fluoride Sources



Fluoride Requirements

Age	AI mg/day
0 – 6 months	0.01
7 – 12 months	0.5
1 – 3 years	0.7
4 – 8 years	1.0
9 – 13 years	2.0
14 – 18 years	3.0
19+ years (men)	4.0
19+ years (women)	3.0
Pregnant and lactating	3.0

Fluoride Deficiency



Fluoride Toxicity

 Enamel Fluorosis

 Skeletal Fluorosis



Fluoride Review

 Function

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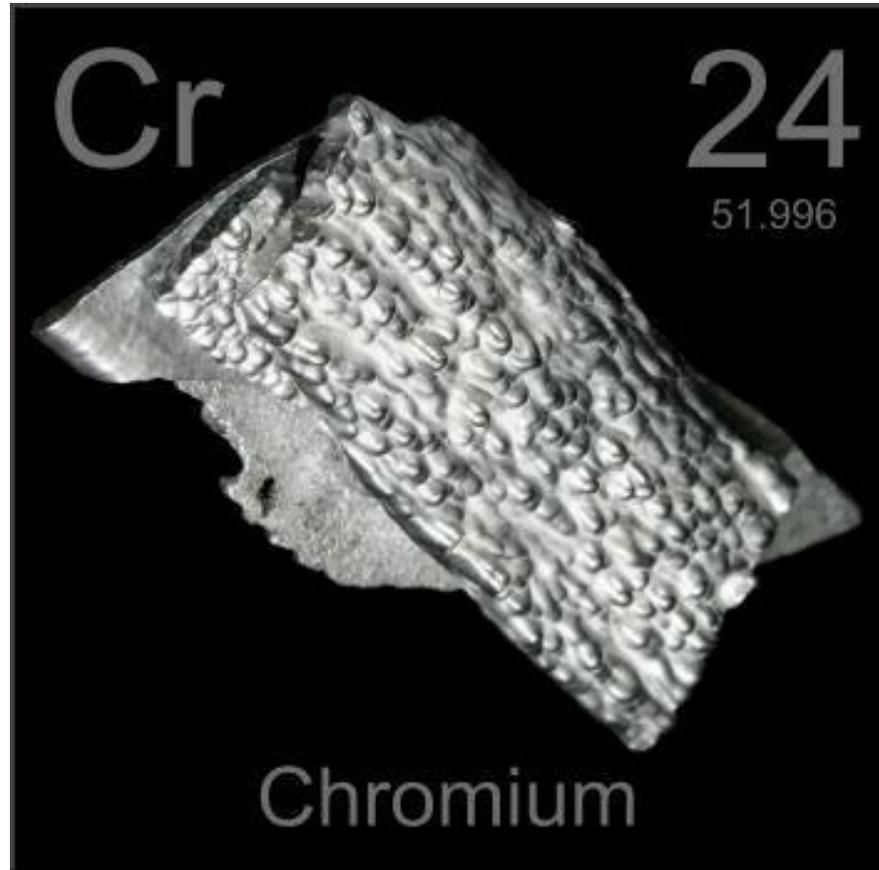
 Recommendations

 Deficiency

 Toxicity



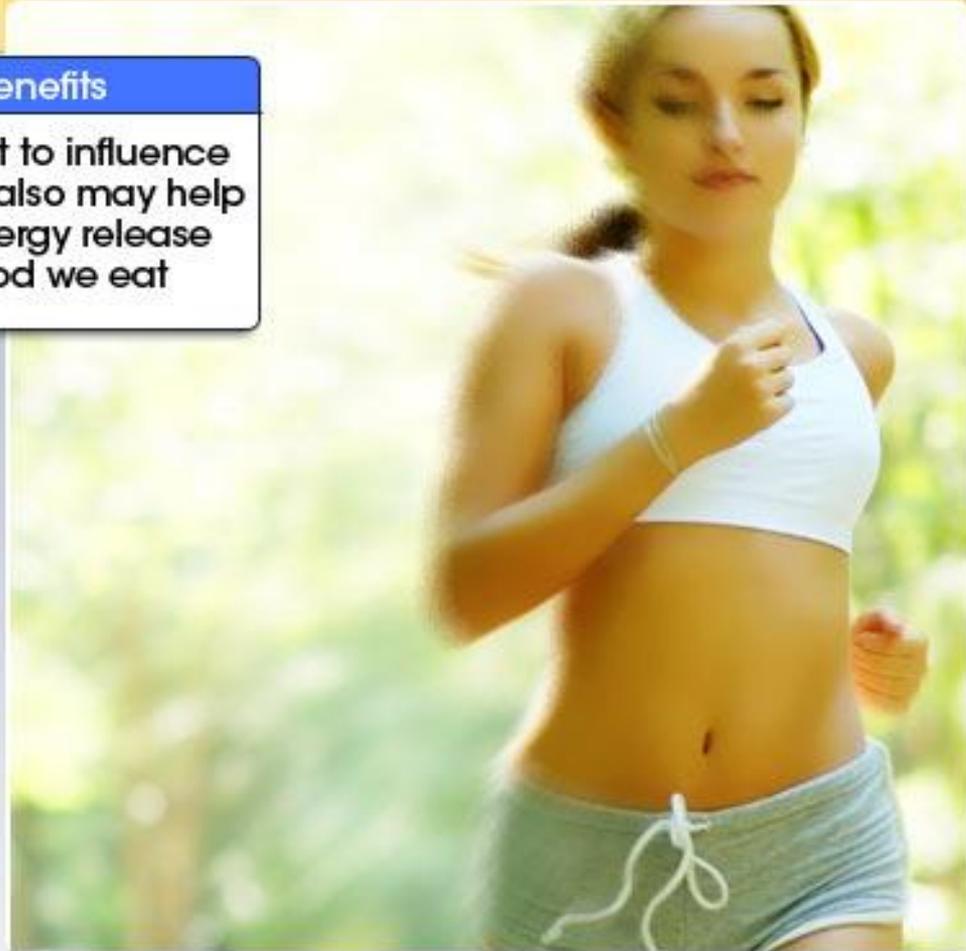
What Is Chromium



Chromium Functions

Benefits

Thought to influence insulin, also may help with energy release from food we eat



Chromium Sources



Chromium AI – mcg/day

Men & Women

0 – 6 months	0.2	0.2
7 – 12 months	5.5	5.5
1 – 3 years	11	11
4 – 8 years	15	15
9 – 13 years	25	21
14 – 18 years	35	24
19 – 50 years	35	25
51 years +	30	20
Pregnancy	-	30
Lactating	-	45

Chromium Deficiency

- ❖ Glucose intolerance
- ❖ Weight loss
- ❖ Peripheral neuropathy



www.blog.mineralifeonline.com

*The
Weight Loss
Mineral That
Burns Fat...*

Chromium Toxicity

Trivalent chromium

Hexavalent chromium



Chromium Review

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Questions, Comments



embracing your health

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(574) 753-1462

dietitian@logansportmemorial.org