

ZINC

HANDOUT

The mineral zinc is omnipresent in the body and has a wide range of clinical, biochemical and immunological functions. As a vital component of more than 200 enzyme reactions, zinc can be considered a cornerstone upon which the foundations of life exist. Adequate zinc intake supports cell reproduction, tissue growth and repair, the immune system and sensory responses. It helps the body create and use proteins, carbohydrates, and fats to produce energy. Zinc deficiency can have far-reaching health consequences and affect the immune system, skin and cell health, and normal growth. Symptoms of zinc deficiency can include skin changes, appetite loss, and fatigue.

Since zinc is not stored or manufactured in the body, it must be ingested in proper amounts. Animal foods, such as beef, poultry, seafood, eggs, and dairy products, are excellent sources of zinc; and, although zinc is found in plant-based foods, it is not well absorbed from these foods.

How Much Zinc Do You Need?

Based on various indicators of zinc nutritional status, the Recommended Dietary Allowance for zinc is established as the intake likely to prevent deficiency in most individuals in each age/gender group (**Table 1**).

Table 1. Recommended Dietary Allowances for Zinc

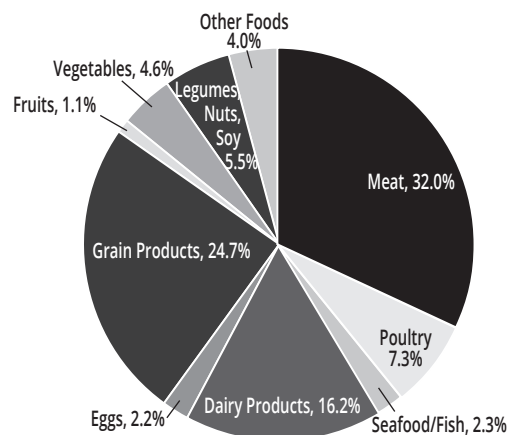
Age	Male	Female	Pregnancy	Lactation
0-6 months	2 mg*	2 mg*		
7-12 months	3 mg	3 mg		
1-3 years	3 mg	3 mg		
4-8 years	5 mg	5 mg		
9-13 years	8 mg	8 mg		
14-18 years	11 mg	9 mg	12 mg	13 mg
19+ years	11 mg	8 mg	11 mg	12 mg

*Adequate Intake

Institute of Medicine, Food and Nutrition Board. Dietary Reference Intakes for Vitamin A, Vitamin K, Boron, Chromium, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington, D.C.: National Academy Press, 2001.

Infants and children need sufficient zinc for growth and cognitive development. Recent research suggests that zinc deficiency is relatively common in older breastfed infants and young children. During adolescence, zinc needs increase to support rapid bone and tissue growth. Zinc needs for pregnant and nursing mothers increase by approximately 50 percent. Vegetarians are recommended to consume 50 percent more than the current RDA recommendations to account for the decreased absorption of plant-based zinc.

SOURCES OF ZINC IN THE U.S. FOOD SUPPLY



ZINC DISTRIBUTION IN THE HUMAN BODY

Tissue	Proportion of Total Body Zinc (Percent)
Muscle	60
Bone	29
Liver	2
Gastrointestinal Tract	1
Skin	1
Kidney	1
Brain	1
Lung	1
Prostate	1
Other Organs	<1

SOURCES

American Dietetic Association. Position of the American Dietetic Association: vegetarian diets. http://www.vrg.org/nutrition/2009_ADA_position_paper.pdf. Published July 2009

Duyff, R. (2012) *American Dietetic Association Complete Food & Nutrition Guide*, 4th Edition. Hoboken, NJ: John Wiley & Sons, Inc.

Beef Checkoff (1998) *Zinc in Human Nutrition*, 2nd Edition. Chicago, IL: National Cattlemen's Beef Association.

United States Department of Agriculture, Center for Nutrition Policy and Promotion, Nutrient Content of the US Food Supply, 2009-2010. Accessed at <https://www.cnpp.usda.gov/USfoodsupply>

SELECTED FOOD SOURCES OF ZINC

Food (3 ounces, cooked, lean only)	Zinc (mg)
Beef	
Chuck Center Roast, braised	9.6
Blade Chuck Roast, braised	8.7
Brisket, Flat Half, braised	6.8
Ribeye Filet, grilled	6.1
Ground, 90% lean, pan-broiled	5.4
Top Sirloin Steak, broiled	4.9
Top Round Steak, grilled	4.4
Strip Steak, grilled	3.8
Tenderloin Roast, roasted	3.6
Pork	
Shoulder Blade, Boston roasted	3.6
Tenderloin, roasted	2.1
Ham, boneless, 5% fat	1.9
Loin Chop, broiled	1.9
Lamb	
Leg, Shank Half, roasted	4.3
Loin, roasted	3.5
Veal	
Sirloin, braised	4.0
Cutlet, pan fried	2.8
Chicken	
Liver, simmered	3.4
Dark meat, roasted	1.8
Breast meat, roasted	1.0
Turkey	
Dark meat, roasted	3.5
Light meat, roasted	1.0
Fish	
Tuna, light meat, canned	0.6
Ocean Perch, dry heat	0.3
Halibut, dry heat	0.4
Salmon, Sockeye, dry heat	0.5
Shellfish	
Oyster, moist heat	66.8
Crab, Alaskan king, moist heat	6.5
Shrimp, moist heat	1.4

Food	Zinc (mg)
Dairy Products	
Yogurt, lowfat, plain, 1 cup	2.2
Milk, lowfat, 1 cup	1.0
Cheese, Cheddar, 1 ounce	1.0
Cheese, Cottage, lowfat, ½ cup	0.4
Cereals	
Raisin Bran, dry, 1 cup	2.0
Shredded Wheat, dry, 1 cup	1.5
Oatmeal, instant, ½ cup	0.7
Cream of Wheat, instant, ½ cup	0.2
Corn Flakes, dry, 1 cup	0.3
Grains	
Oat Bran Muffin, 1 medium	2.1
Bran Rice, cooked, ½ cup	0.7
Bagel, 3½ inch	0.9
Whole Wheat Bread, 1 slice	0.5
White Rice, (enriched), cooked, ½ cup	0.4
White Bread (enriched), 1 slice	0.3
Fruit	
Banana, 1 medium	0.2
Apricots, dried, 7 halves	0.1
Prunes, dried, 3 medium	0.1
Orange, 1 medium	0.1
Apple, 1 medium	0.1
Raisins, 2 tablespoons	0.1
Vegetables	
Peas, green, cooked, ½ cup	1.0
Potato, baked w/ skin, 1 medium	0.6
Corn, cooked, ½ cup	0.5
Broccoli, raw, ½ cup	0.2
Spinach, raw, 1 cup	0.2
Iceberg Lettuce, chopped, 1 cup	0.1
Carrots, raw, 1 medium	0.2
Beans/Legumes	
Baked Beans, canned, plain, ½ cup	2.9
Chickpeas, boiled, ½ cup	1.3
Kidney Beans, boiled, ½ cup	0.9
Meat Substitutes	
Egg substitute, ½ cup	1.2
Tofu, raw, ½ cup	1.0
Peanut Butter, 2 tablespoons	0.8
Egg, whole, cooked, scrambled	0.6

SOURCE

Nutrient Database for Standard Reference, Release 28. Version Current: September 2015, slightly revised May 2016. Internet: <https://ndb.nal.usda.gov/ndb/>

