Vegetarian Nutrition

a dietetic practice group of the

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RD Resources for Consumers:

Zinc in Vegetarian Diets

Zinc is a nutrient of special interest in the planning of well-balanced plant based diets.

Zinc is present in all organs, tissues and fluids in the body. Zinc has many functions in the body, and is necessary for optimal growth and development, reproduction, appetite, taste ability, and night vision. Zinc is also needed for proper function of the immune system.

Zinc Requirements

Zinc is widely available from many types of foods, so deficiency is rare in North Americans including Western vegetarians. However, a recent government sample showed that approximately 12 percent of the population had inadequate intakes. The Recommended Daily Allowance (RDA) for zinc, is 3-11 milligrams (mg) for children and teens, 11 mg for adult men, and 8 mg for adult women. As with many other nutrients, there are upper limits which should not be exceeded. For zinc, this limit is 40mg/day. Note that some mineral supplements on the market can exceed this upper limit recommendation.

See 'Resources' section for more information regarding RDAs.

Factors Affecting Zinc Absorption

Phytate, a phosphorus-containing compound found in grains, nuts, and legumes, reduces zinc bioavailability from these foods, which are common in vegetarian diets. Vegetarian diets often contain two to three times more phytate than non-vegetarian diets so phytate can markedly affect zinc absorption in vegetarians.

Whole grain products are frequently higher in zinc than products made from refined grains so that, despite the higher phytate content of whole grains, the absolute amount of zinc absorbed from whole grains is often higher than from refined grains. However, a number of dietary factors and practices can improve zinc absorption from plant foods. Fermentation partly destroys phytate so fermented soy foods such as tempeh or miso are good sources of zinc. Similarly, yeast-raised or lactic acid fermented sourdough bread is a better zinc source than whole grain cereals or muffins.

Sample Menu

The following one day balanced vegetarian menu offers more than 16 mg of zinc.

Breakfast

- Breakfast cereal (1 cup) with ½ cup soy milk
- Veggie Sausage
- Fruit

Lunch

- Veggie or Chicken burger on whole wheat bread
- Sliced carrots

Snack

- Cashews or peanuts (2 tbsp)

Dinner

- Grilled Tofu or Tempeh with BBQ sauce (1/2 cup)
- Nutritional Yeast sprinkled on top
- Corn (1/2 cup)
- Steamed Kale (1/2 cup)

Zinc Content of Selected Foods

Grain Products

Total, ¾ cup **15mg**

Wheaties, 1 cup **6.7mg**

Rice Chex, 1 cup **3.7mg**

Raisin Bran, 1 cup **4.7mg**

Wheat germ, 1/4 **3.3mg**

Oatmeal, 1 cup cooked **1.5mg**

Whole wheat bread **0.5mg**

Vegetables

Peas, 1/2 cup **1.0mg**

Mushrooms or Spinach, 1/2 cup cooked **0.7mg**

Corn, 1/2 cup **0.6mg**

Nuts, Seeds, and Other

Nutritional Yeast "Red Star", 1 ½ tbsp. **3.2mg**

Tahini, 2 tbsp. **2.8mg**

Pumpkin seeds, 2 tbsp. **2.1mg**

Peanuts, 2 tbsp. **0.6mg**

Peanut butter, 2 tbsp. **0.9mg**

Cashews, 2 tbsp. **1.0mg**

Sunflower seeds, 2 tbsp. **0.9mg**

Brazil nuts, 2 tbsp. or 4 nuts **0.7mg**

Legumes and Soy Products

Green Giant Harvest Burger, 1 burger **8.0mg**

Yves Veggie or Chicken burger, 1 burger **5.2mg**

White beans, ½ cup cooked **1.5mg**

Textured vegetable protein, 1/2 cup prepared **1.4mg**

Tofu, 1/2 cup **1.3mg**

Tempeh, 1/2 cup **1.3mg**

Chickpeas, 1/2 cup cooked **1.3mg**

Lentils, 1/2 cup cooked **1.2mg**

Kidney, lima, or soybeans, 1/2 cup cooked **1.0mg**

Soymilk, 1 cup **0.9mg**

Black-eyed peas, 1/2 cup cooked **0.8mg**

Miso, 1 tbsp. **0.6mg**

Animal Products

Yogurt, 1 cup **1.8mg**

Swiss cheese, 1 oz. **1.1mg**

Milk, 1 cup **0.9mg**

Egg, 1 large **0.6mg**

Resources

Messina M, Mangels R, Messina V. The Dietitian's Guide to Vegetarian Diets: Issues and Applications., 2nd ed. Sudbury, MA: Jones and Bartlett Publishers, 2004.

American Dietetic Association (ADA) Position Paper 2003 http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/advocacy_933_ENU_HTML.htm

Explanation and Frequently Asked Questions about Recommended Dietary Allowances (RDA) http://virtual.clemson.edu/groups/NIRC/pdf/rdadri.pdf

USDA National Agricultural Library: Information about Dietary Guidance and Reference Intakes http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=2&tax_subject=256&topic_id=1342

Protein appears to promote zinc absorption. Emphasizing foods that are good sources of both protein and zinc, such as legumes and nuts, can increase both zinc intake and absorption.

Both iron and calcium lower zinc absorption. When large doses of iron are taken as a supplement, as during pregnancy, zinc should be taken as well. Calcium, when added to a yeast-dough before rising, will block some of the phytate from being destroyed and will lower zinc availability. Use of calcium supplements can also interfere with zinc absorption. Vitamin D can increase the bioavailability of zinc.

Zinc absorption is enhanced when body stores are low. Pregnancy and lactation both increase zinc absorption.

Meeting Zinc Needs on a Plant-based Diet

- Emphasize zinc-rich foods such as whole grains, legumes, fortified breakfast cereals, nuts, seeds, and dairy products.
- Use whole grain bread more than crackers and other products made without yeast.
- Choose whole grain cereals instead of refined cereals.
- Use fermented soy products.
- Soak dried beans and discard the soaking water prior to cooking to increase zinc bioavailability.
- When large doses of iron are taken as a supplement, as during pregnancy, take a zinc supplement. Long-term use of zinc supplements does not appear to cause any down-regulation of zinc absorption.
- Avoid taking calcium supplements immediately before or after a meal containing good sources of zinc.
- Zinc supplementation should be considered for young children following vegan diets based on high-phytate cereals and legumes.
- Well planned vegetarian/vegan diets can account for up to 20 mg Zn/day easily meeting recommendations.

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RD Resources are a member benefit of the Vegetarian Nutrition Dietetic Practice Group. They are available in the Members Section of the website at **www.VegetarianNutrition.net**.

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