

# Fruits and Bone Health

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## Why Fruits Enhance Bone Health

We know that calcium is associated with bone health, but there are many other nutrients that contribute to bone health. Fruits contain essential vitamins, minerals, fiber and phytochemicals that have been shown to protect against bone loss, and adequate intake of these nutrients is important for maintaining bone health throughout life.

## Vitamins

Fruits are an excellent source of vitamins A and C and a good source of vitamins E, K and many B vitamins. These are essential in metabolic processes in the body, such as proper utilization of other nutrients, growth, reproduction and immunity.

**Vitamin A** is a fat-soluble vitamin involved in growth and bone development. It is stored in the liver, and excess intake of vitamin A has been associated with bone loss and a higher risk for hip fracture.

**Vitamin C** is particularly important for proper bone formation and synthesis of connective tissue. Severe deficiency of vitamin C results in thin, poorly formed bones, fatigue and delayed wound healing. Vitamin C supplementation in postmenopausal women has been linked with reduced bone loss.

**Vitamin E** has antioxidant properties, and supplementation is associated with bone-protective effects and reduced bone loss in postmenopausal women.

**Vitamin K** works synergistically with vitamin D in bone metabolism, and vitamin K can increase bone mineral density and reduce osteoporosis-associated fractures.



## Good Food Sources

- **Vitamin A:** apricots, avocados, cantaloupes, cherries, mangos, nectarines, papayas, tomatoes
- **Vitamin C:** blackberries, blueberries, cantaloupes, elderberries, mangos, oranges, papayas, tomatoes
- **Vitamin E:** apricots, avocados, blackberries, blueberries, mangos, papayas
- **Vitamin K:** apricots, avocados, bananas, cantaloupes, papayas, tomatoes

## Minerals

Fruits contain important bone-forming minerals such as calcium, phosphorus, magnesium and zinc that are needed to maintain bone density. Minerals are essential cofactors in the

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formation of many enzymatic and metabolic processes; therefore, adequate amounts are needed to prevent bone loss.

## Dietary Fiber

Dietary fibers are non-digestible carbohydrates not able to be broken down by the human body. Fibers found in fruits form gels when eaten and contribute to fullness in the stomach. This quality is beneficial in weight loss and weight management. Soluble fibers slow down digestion and increase absorption of nutrients, especially minerals such as magnesium and calcium important in bone health. Men should aim for 35 grams of fiber per day and women for 25 grams per day.

## Phytochemicals

Fruits contain potent antioxidants known as phenolic compounds. These compounds, e.g., anthocyanins, give fruits their colors and have shown protective effects toward oxidative stress and bone loss. Plums, blueberries and blackberries are fruits rich in antioxidants that have been shown to prevent bone loss.

### Plum Bread

1 egg  
1/2 cup honey  
2/3 cup white sugar  
1 teaspoon vanilla extract  
2 cups all-purpose flour  
1 teaspoon baking soda  
1/2 teaspoon ground cloves  
1/4 teaspoon ground cinnamon  
1 cup peeled and chopped plums  
1 cup chopped walnuts (optional)

Preheat oven to 350 degrees F (175 degrees C). Lightly grease a 9- x 5-inch loaf pan. In a large bowl, blend egg, honey, sugar and vanilla. Mix in flour, baking soda, cloves and cinnamon. Fold in plums and walnuts. Transfer batter to the prepared loaf pan. Bake 50 to 60 minutes in preheated oven, until a toothpick inserted in the center of the loaf comes out clean. Makes 12 servings.

## Serving Size

The Dietary Guidelines for Americans recommends two to four servings of fruit per day, depending on activity level.

One serving size is equivalent to 1 medium-sized whole fruit, 1/2 cup diced fruit, 1/4 cup dried fruit or 4 ounces fruit juice.

## Healthy Choices

- **Eat a variety of fruits.** The diversity of nutrients in each type of fruit varies, so eating fruits of different colors gives the body a wide range of nutrients.
- **Snack on fruits.** Replacing high-calorie snack options with fruit can help manage weight. Fruits are convenient and easy to eat on the go.
- **Choose fresh fruit over fruit juices.** Fruit juices are made without the skin or pulp of the fruit, which is where the fiber is contained. Fruit juices usually have added sugars that contribute solely to calories. For example, 6 ounces of orange juice has 85 calories compared to just 65 calories for a medium orange.
- **Frozen or canned fruits are good options.** Choose canned fruits in their juice instead of syrups. Choose canned fruits or juice with no added sugars.
- **Pay attention to serving sizes.** Many dried fruits are high in iron, potassium and selenium, essential nutrients for maintaining healthy bone. The dehydration process makes the fruit more calorie-dense than fresh fruit, so note the serving size – 1 ounce dried and sweetened cranberries contains 86 calories compared to 13 calories in 1 ounce of fresh cranberries.

## References

United States Department of Agriculture. 2005 Dietary Guidelines for Americans.

Centers for Disease Control and Prevention 2010: Fruit and Vegetable Benefits.

Fruits and Veggies More Matters: Key Nutrients in Fruits and Vegetables.

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