



Eating for Bone Health



Osteoporosis

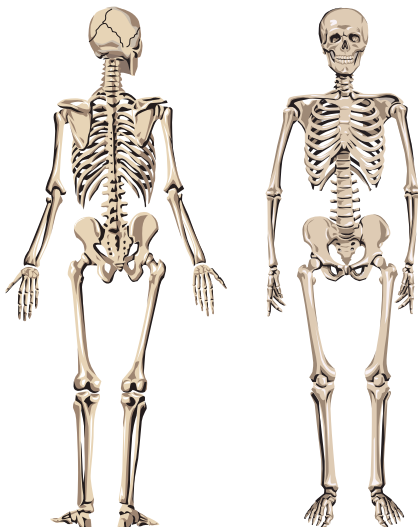
Osteoporosis is a silent disease that weakens bones, making them fragile and more likely to fracture or break. Bone fractures occur mainly in the spine, hip, and wrist. Osteoporosis risk factors that cannot be changed are:

- Being female
- Postmenopausal
- Having a small skeleton
- Being Caucasian/Asian
- Family history of osteoporosis and fractures
- Advanced age

Osteoporosis risk factors that can be changed:

- Medications with negative effects on bone
- Inadequate or excessive intake of nutrients
- Sedentary – no weight bearing activity
- Excessive exercise
- Low body weight
- Cigarette smoking
- High level of alcohol consumption

It is never too late to make positive changes to your lifestyle and eating habits to help prevent osteoporosis. One of the easiest ways to reduce your risk of osteoporosis, is to consume adequate amounts of vitamin D and calcium in your daily diet.



Vitamin D

Adequate vitamin D helps increase the absorption of calcium. Vitamin D is made in the skin after exposure to sunlight. It only requires 5-15 minutes of sun exposure three times a week on the face, hands and arms to meet vitamin D needs. Sunscreens will decrease the formation of vitamin D in the skin. If you regularly use sunscreens, you will need to get vitamin D from your diet or take a supplement. Good dietary sources of vitamin D are fortified foods, fortified milk, egg yolks, liver, sardines and salmon. If a vitamin D supplement is necessary, follow these guidelines:

It is recommended that an individual does not consume more than 2,000 IU of vitamin D per day over a long period of time. Too much vitamin D may cause diarrhea, headache, nausea, and calcium deposits in soft tissues.

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This information has been reviewed by university faculty.

ag.arizona.edu/pubs/health/az1250.pdf

Recommended Vitamin D Intakes

Age	International Units (IU)/Day
0-50 years of age	200
51-70 years of age	400
>70 years of age	600
Pregnancy	
Less than or equal to 18 years through 50 years	200
Lactation	
Less than or equal to 18 years through 50 years	200

Calcium

Adequate calcium intake throughout life is important to maximize calcium storage in the bones during the growing years and to minimize bone loss in later years. Yet, nearly half of the men, women and children in the United States do not get enough calcium.

How Much Calcium Do You Need Each Day?

Recommended Calcium Intakes

Age	Milligram (mg) per day
Infants 0-6 months	210
Infants 6-12 months	270
Children 1-3 years old	500
Children 4-8 years old	800
Adolescent 9-13 years old	1,300
Teenagers 14-18 years old	1,300
Adults 19-50 years old	1,000
Adults 51 years old and older	1,200
Pregnancy	
Less than or equal to 18 years	1,300
19 through 50 years	1,000
Lactation	
Less than or equal to 18 years	1,300
19 through 50 years	1,000

Too much calcium may not be a good thing. It is recommended that an individual does not consume more than 2,500 milligrams (mg) of calcium per day. Consuming too much calcium may lead to dizziness, kidney problems, constipation, fatigue, and poor absorption of iron, zinc and other nutrients.

If you cannot get enough calcium from what you eat and drink, supplements are a safe alternative. When taking a calcium supplement, remember, the body can only absorb about 500 mg of calcium at one time. This amount of calcium should be taken 4 to 6 hours apart.

Start With Foods

Increasing your daily calcium intake is best accomplished by eating foods that are good sources of calcium (provide at least 100 mg of calcium per standard serving size). Try to get 3 to 4 servings of calcium rich foods a day. By eating a variety of foods from the Food Guide Pyramid food groups, you can meet your daily calcium requirements. Some examples of high calcium foods from each of the Food Guide Pyramid Groups are:

Bread, Cereal, Rice, & Pasta Group:

spoonbread, English muffin, calcium fortified cereal, and waffles.

Vegetable Group:

broccoli, kale, and beet greens

Fruit Group:

figs, and calcium fortified fruit juices

Milk, Yogurt, & Cheese Group:

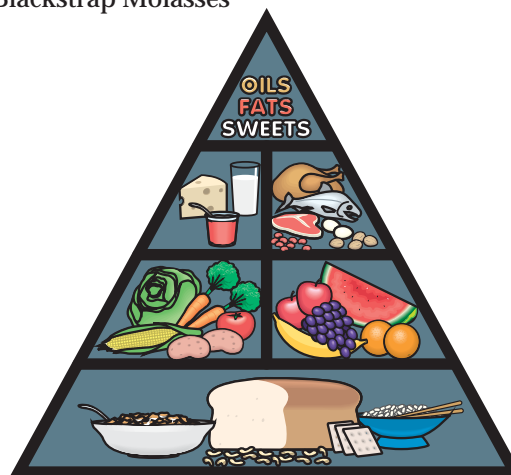
milk and milk products

Meat, Poultry, Fish, Dry Beans, Eggs, & Nuts Group:

tofu products fortified with calcium, sardines and canned salmon with bones, and almonds

Fats Oils, & Sweets:

Blackstrap Molasses



EXAMPLES OF HOW TO MEET YOUR DAILY CALCIUM NEEDS FROM FOOD

Example 1	Calcium (mg)	Calories
Orange juice, fortified, 1 cup	300	110
Skim milk, 1 cup	300	85
Cream soup, 1 cup	185	165
1% cottage cheese, 1/3 cup	45	55
Waffles, 2	155	175
Chocolate pudding, 1/2 cup	150	165
TOTAL	1,135	755

Example 2		
Salmon w/bones 3 oz	200	130
Beans, navy, 1 cup	120	295
Light American cheese, 1 oz	200	70
Cornbread, 2"x 2" square	70	150
Sweet potato, 1 medium	30	115
Turnip greens, 2/3 cup	70	10
Orange, 1 large	70	85
Almonds, dry roasted, 2 oz	150	340
Chocolate ice cream, 1/2 cup	70	140
TOTAL	980	1,335

Example 3		
Soy milk, fortified, 1 cup	300	150
Total Cereal™, 3/4 cup	1000	105
Spaghetti, fortified, 2/3 cup	300	210
Broccoli, 1/2 cup	75	45
TOTAL	1,675	510

Example 4		
Skim milk, 3 cups	900	255
Nonfat yogurt, plain, 1/2 cup	245	70
TOTAL	1,145	325

Reference: The Food Processor® Version 7.5 and manufacture's labels. Some inconsistencies may occur because all figures have been rounded.

How to Find the Calcium Content of a Labeled Food

The calcium content of a food can be found using the Nutrition Facts Panel of the food label. On the Vanilla Lowfat Yogurt food label, locate calcium on the Nutrition Fact Panel (the highlighted portion). This is the Percent Daily Value of calcium for an 8 ounce serving of Vanilla Lowfat Yogurt.

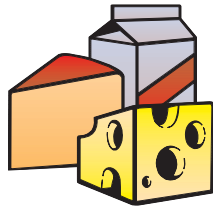
To find the mg of calcium in a standard serving of a food, drop the % sign from the Percent Daily Value and add a zero. For example: 40% Daily Value = 400 mg. This is the amount of calcium in an 8 oz serving of Vanilla Low fat Yogurt. *Note: this only works for finding the mg of calcium in a serving.*

Nutrition Facts Panel

Vanilla Lowfat Yogurt

Nutrition Facts			
Serving Size 8 oz (277g)			
Servings Per Container 1			
Amount Per Serving			
Calories 210		Calories from Fat 30	
% Daily Value*			
Total Fat 3g			2%
Saturated Fat 2g			10%
Cholesterol 15mg			5%
Sodium 160mg			7%
Total Carbohydrate 36g			12%
Dietary Fiber 0g			0%
Sugars 34g			
Protein 10g			
Vitamin A 2%	•	Vitamin C 4%	
Calcium 40%	•	Iron 0%	
*Percentage Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	•	Carbohydrate 4	• Protein 4

Top 10 tips for Increasing Calcium in Your Diet



- Purchase and eat foods labeled “high,” “rich in,” “excellent source,” or “good source” of calcium.
- Eat or drink 3 servings of reduced-fat milk products daily.
- Use reduced-fat cheeses as toppings and snacks.
- Add reduced-fat milk to your coffee or tea.
- Substitute reduced fat yogurt or milk for water in pancakes.
- Use reduced-fat yogurt in place of mayonnaise in salad dressings and dips.
- Fortify your foods with calcium by adding nonfat powdered milk to a variety of foods such as meat loaf, sauces, gravies, soups, stuffings, casseroles, blended beverages, puddings, breads, cookies, brownies, mashed potatoes, milk, cooked cereal, and scrambled eggs.
- Eat more vegetables that are good sources of calcium such as beet, mustard, and turnip greens.
- Use calcium fortified tofu in meatloaf, lasagna and desserts to replace part or all of the meat or cheese.
- Buy products fortified with calcium.

The inserts provide recipes for foods that can help you get the calcium you need.

Additional Resources on Nutrition and Bone Health

Organizations & Websites

National Osteoporosis Foundation

www.nof.org

1150 17th Street, NW

Suite 500

Washington, DC 20036-4603

202-223-2226

1-800-223-9994

National Dairy Council

www.nationaldairycouncil.org/index.html

3030 Airport Road

LaCrosse, WI 54603

1-800-426-8271

Dairy Council of Arizona

PO Box 26877

Tempe, AZ 85285

480-966-7211

Arizona Osteoporosis Coalition

www.fitbones.org

Bone Builders

www.bonebuilders.org

The University of Arizona

Maricopa County Cooperative Extension

4341 East Broadway Road

Phoenix, AZ 85040

602-470-8086 Ext. 316

National Institutes of Health - Osteoporosis & Related Bone Diseases National Resource Center

www.osteo.org

1232 22nd Street, NW

Washington, DC 20037

202-223-0344

1-800-624-BONE

Nutrition, Exercise & Wellness

University of Arizona, College of Agriculture & Life Sciences, Cooperative Extension, Department of Nutritional Sciences

<http://ag.arizona.edu/nsc/new>

www.whymilk.com - calcium information and recipes

Publications

Stanford V, Houtkooper L. Calcium and Calorie Content of Selected Foods. *The University of Arizona, College of Agriculture Cooperative Extension. AZ1128, 2004: 4 pp. Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: <http://ag.arizona.edu/pubs/health/az1128.pdf>*

Mullins VA, Houtkooper L. Calcium Supplement Guidelines, AZ1042, 2004:4 pp. *Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: <http://ag.arizona.edu/pubs/health/az1042.pdf>*

Misner S. Osteoporosis. *Tucson, AZ: University of Arizona Cooperative Extension; 2000. Posted on the College of Agriculture & Life Sciences, Cooperative Extension Website and available for download at: <http://ag.arizona.edu/pubs/health/az9712.pdf>*

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RECIPES

CHEESE AND VEGETABLE PASTA

1 12-ounce can evaporated skim milk
4 teaspoons all-purpose flour
1/4 teaspoon salt
1/8 teaspoon pepper
1/8 teaspoon ground nutmeg
3/4 cup shredded Jarlsberg or Swiss cheese
1 - 7.25-ounce jar roasted red sweet peppers, drained and chopped
10 ounces pasta (fettuccine, rotini, or bow ties)
1 16-ounce package (4 cups) loose-pack frozen mixed vegetables, such as Italian or California blend
1/4 cup toasted sliced almonds (optional)

In a screw-top jar shake together milk, flour, salt, pepper, and nutmeg. Pour into a saucepan. Cook and stir over medium heat until bubbly. Cook and stir 1 minute more. Remove from heat; stir in cheese until just melted. Stir in roasted sweet peppers.

Meanwhile, in a 4-quart Dutch oven or large pot cook pasta according to package directions, adding vegetables the last 5 minutes of cooking time; drain. Place pasta mixture on a serving platter; spoon cheese mixture on top. Sprinkle with almonds, if desired. Makes 4 main course servings.

Nutrition Information per Serving:

Calories	490
Carbohydrates	75 gm
Fat	10 gm
Protein	25 gm
Sodium	490 mg
Fiber	8 gm
Calcium	520 mg

COTTAGE MUFFINS

2 cups all-purpose flour
1 cup yellow cornmeal
4 teaspoons baking powder
1/4 teaspoon salt
3 Tablespoons sugar
2 eggs
1 cup 1% buttermilk
1 cup low fat cottage cheese
1/3 cup salad oil

Pre-heat oven to 400°F. In a large bowl, combine flour, cornmeal, baking powder, salt, and sugar; mix well. In blender or food processor, place eggs, buttermilk, cottage cheese and salad oil. Blend until smooth. Make a well in center of flour mixture and add liquid ingredients all at once. Stir with a fork just enough to blend ingredients. Spoon into two well-greased muffin pans, filling two-thirds full. Bake until golden brown (about 20 minutes). Yield 24 muffins.

Nutrition Information per Serving (2 muffins)

Calories	225
Carbohydrates	30 gm
Fat	8 gm
Protein	8 gm
Sodium	310 mg
Fiber	1 gm
Calcium	140 mg

CHEF'S SALMON SALAD

1 lb. canned red sockeye salmon
6 cups salad greens (romaine, spinach, Bibb lettuce)
2 hard cooked eggs, quartered
1 large tomato, wedged
½ cucumber, sliced
1/4 red onion, sliced
4 Lemon wedges, 4 sprigs fresh parsley
8 teaspoons low-calorie dressing

Drain salmon well; place in medium size bowl. Remove visible salmon skin and discard. Crush salmon bones with your fingers and add back to the bowl. Chunk salmon into large pieces with a fork. Line one large or individual salad bowls with salad greens. On top of greens make an arrangement of eggs, tomatoes, cucumbers and salmon. Top with onion rings, parsley leaves and lemon. Serve with your favorite French or mayonnaise-type dressing. Yield: 4 servings.

Nutrition Information per Serving

Calories	300
Carbohydrates	7 gm
Fat	18 gm
Protein	28 gm
Sodium	775 mg
Fiber	2 gm
Calcium	250 mg

STRAWBERRY SMOOTHIE

1½ cups strawberries
8 oz vanilla low fat yogurt
¾ cup skim milk
1 Tablespoon brown sugar
1/8 teaspoon cinnamon

In a blender container combine yogurt, strawberries, milk, brown sugar, and cinnamon. Cover and blend till smooth. If desired, garnish each glass with a whole strawberry. Makes 4 (6-ounce) servings.

Nutrition Information per Serving:

Calories	90
Carbohydrates	15 gm
Fat	1 gm
Protein	5 gm
Sodium	65 mg
Fiber	1 gm
Calcium	165 mg

TOFU & BEEF MEATLOAF

1 lb. soft tofu, drained (about 2 cups)
1 Tablespoon dry parsley
2 eggs
1 lb. extra lean ground beef
1 medium onion, finely chopped
½ cup dry breadcrumbs
¼ cup tomato sauce
Additional tomato sauce (optional)

Preheat oven to 350° F. Combine tofu, parsley, and eggs in a large bowl and mix. Add ground beef, onions, breadcrumbs, and tomato sauce, mixing well. Lightly oil a loaf pan. Spoon wet mixture into pan. Top with more tomato sauce if desired. Bake for 1 to 1 ½ hours. Serve hot with more tomato sauce if desired. Yield: 8 servings.

Nutrition Information per Serving:

Calories	190
Carbohydrates	10 gm
Fat	8 gm
Protein	20 gm
Sodium	310 mg
Fiber	1 gm
Calcium	200 mg

TURKEY ENCHILADAS

2 cups cooked turkey, shredded
2 cans 98% fat free cream of mushroom soup
16 ounces fat free sour cream
4 ounces diced green chili
1 cup diced onion
1 cup nonfat milk
16 corn tortillas
2 cups low fat cheese, shredded

Preheat oven to 350° F. Lightly coat a 13- by 9-inch baking dish with vegetable cooking spray. In a large bowl combine turkey, soup, sour cream, chilies, onion and milk. Heat each tortilla in microwave for a few seconds just to soften. Spoon about 3 tablespoons of turkey filling onto softened tortilla. Top with about 1 tablespoon shredded cheese. Roll. Place seam-side down in the baking dish. Fill remaining tortillas. Spoon any leftover filling over the top of enchiladas. Sprinkle with cheese. Bake uncovered 35 to 45 minutes or until bubbly and cheese is melted. Yield: 8 servings.

Nutrition Information per Serving:

Calories	335
Carbohydrates	45 gm
Fat	6 gm
Protein	25 gm
Sodium	1060 mg
Fiber	3 gm
Calcium	355 mg

VEGETABLE CHEDDAR CHOWDER

2 Tablespoons butter
1 cup diced zucchini
½ cup chopped onion
½ cup diced green pepper
¼ cup thinly sliced carrots
¼ cup finely chopped celery
2 Tablespoons flour
3 cups skim milk
1 cup shredded sharp cheddar cheese
1/8 teaspoon salt
1/16 teaspoon black pepper
¼ teaspoon crushed, dried red pepper (optional)

In a medium saucepan melt butter. Add zucchini, onion, green pepper, carrots, and celery. Sauté until onion is tender, about 5 minutes. Stir in flour; cook and stir for 1 minute. Gradually stir in milk; cook and stir until mixture boils and thickens. Blend in cheddar cheese, salt and black and dried red peppers (optional); heat and stir just until cheese melts. Serve hot. Yield: 3 ½ cups; serves 4.

Nutrition Information per serving:

Calories	275
Carbohydrates	20 gm
Fat	15 gm
Protein	15 gm
Sodium	415 mg
Fiber	1 gm
Calcium	450 mg

BONE BUILDER GRANOLA BARS

½ cup dried apples, snipped in small pieces
1/3 cup honey
1/4 cup raisins
1 Tablespoon packed brown sugar
1/3 cup peanut butter
1/4 cup apple butter
½ teaspoon grated orange rind
½ cup rolled oats
¾ cup slivered almonds, chopped
1/3 cup wheat germ, toasted
2 cups Total Brand cereal

In a large saucepan combine apples, honey, raisins, and brown sugar. Heat and stir until mixture boils. Reduce heat slightly. Cook, uncovered, for 1 minute, stirring constantly. Remove from heat. Stir in peanut butter until melted. Blend in apple butter and orange rind. Stir in rolled oats, almonds, and wheat germ until well combined. Add cereal, stirring to coat. Press mixture very firmly (or bars will crumble) and evenly into an 8x8x2 inch pan which has been lightly sprayed with vegetable cooking oil. Mark into 16 1"x4" bars. Chill thoroughly.

Nutritional Information per Serving (1 bar)

Calories	160
Carbohydrates	22 gm
Fat	6 gm
Protein	4 gm
Sodium	60 mg
Fiber	2 gm
Calcium	190 mg

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