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Healthy Eating for Bone Health

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Building strong bones, especially before the age of 30, is important. As we age, bone loss accelerates.

Osteoporosis is a condition characterised by the loss of normal bone density, leading to fragile bones and increased risk of breaking bones (bone fracture). A healthy lifestyle is therefore critically important as the best defense against osteoporosis.

Calcium and Vitamin D

A healthy diet must include adequate calcium, one of the major building blocks of healthy bones and teeth. It also helps muscles and nerves to function properly and control blood pressure. While the adverse effects of calcium-poor diets tend to show up only in later years, it is especially important to get adequate calcium in diet throughout adolescence into adulthood. Studies of older adults show that adequate calcium can slow down bone loss and lower the risk of fracture.

The amount of calcium we need changes throughout the lifetime. The following recommendations were made in 2010 by the Institute of Medicine:

Life Stage Group	Calcium Recommended Dietary Allowance (mg/day)	Vitamin D Recommended Dietary Allowance (IU/day)
1 to 3 years old	700	600
4 to 8 years old	1,000	600
9 to 13 years old	1,300	600
14 to 18 years old	1,300	600
19 to 30 years old	1,000	600
31 to 50 years old	1,000	600
51 to 70 years old, male	1,000	600
51 to 70 years old, female	1,200	600
>70 years old	1,200	600
14 to 18 years old, pregnant/lactating	1,300	600
19 to 50 years old, pregnant/lactating	1,000	600

Source: Food and Nutrition Board. Institute of Medicine-National Academy of Sciences U.S. 2010.

Your body needs vitamin D to help absorb calcium and build strong bones. Vitamin D comes from skin exposure to sunlight and diet. Foods such as margarine, eggs, salmon, sardines, mackerel and fish oil all contain some amounts of Vitamin D. However they should not be taken in excess.

Foods with Vitamin D	Weight (g)	Vitamin D (IU)
Cod liver oil	15	440
Salmon	100	470
Mackerel	100	470
Full cream milk powder	100	380
Tuna	100	268
Sardine	100	193
Pork Liver	100	64
Egg	1 large	41
Caviar	28	33

Other Dietary Suggestions

1. Isoflavones in soybeans, which function like estrogen and act as antioxidants in bone cells, can prevent calcium loss of the cells.
2. Protein increases the loss of calcium in urine, especially animal protein.
3. High sodium intakes, particularly in association with a low calcium intake, can contribute to osteoporosis by increasing calcium excretion.
4. Recent studies showed that Vitamin K might regulate the calcium binding capacity of osteocalcin, a protein for binding calcium in the bone matrix. A diet containing foods with Vitamin K such as green leafy vegetables is therefore recommended.
5. Vegetables are good sources of fibre, oxalic acid and phytic acid. However, excess intake can reduce calcium absorption.
6. Avoid dieting.

Long-term use of steroids, anti-epileptic drugs and anti-coagulants may cause osteoporosis, and should be supplemented by adequate intake of calcium and Vitamin D. To prevent destruction of nutrients and reduce medicinal effect, eat less calcium-containing food while taking antibiotics, e.g. Tetracycline.

Exercises

In addition to calcium intake, exercise is also important to build strong and healthy bones. In general, people who lead an active lifestyle have stronger and denser bones than the sedentary. The best exercises for building strong bones are “weight-bearing” activities, such as walking, jogging, running, dancing, squash and climbing stairs. Other muscle-strengthening exercises, such as weightlifting, are also important.

Lifestyle Changes

1. Do not smoke

Smoking increases bone loss, perhaps by reducing estrogen production in women and calcium absorption in the intestines.

2. Avoid excessive alcohol

Excessive alcohol is typically accompanied by poor dietary intake and smoking. Consuming more than two alcoholic drinks a day may reduce bone formation and the body’s ability to absorb calcium.

3. Limit caffeine intake

Excessive caffeine intake may have a deleterious effect on bone mass density. Moderate caffeine consumption (about 2 to 3 cups of coffee, tea or cola drinks per day) is acceptable provided that the diet contains adequate calcium.

Finding High-Calcium Foods from Nutrition Labels

Nutrition Claims

Claim	Meaning of claim	Examples with conditions stipulated in law
Source; Contains; With; Provides; Has	A significant amount of a particular nutrient found in the food; Contains a useful amount of this nutrient	Source of calcium (containing no less than 120mg of calcium per 100g of solid food; no less than 60mg of calcium per 100ml of liquid food)
High; Good source; High source; Rich in; Plenty of	A very significant amount of a particular nutrient found in the food; Contains a high amount of this nutrient	High calcium (containing no less than 240mg of calcium per 100g of solid food; no less than 120mg of calcium per 100ml of liquid food)

Calcium Content of Some Common Foods

Dairies and Alternatives

	Portion	Weight (g)	Calcium (mg)
Skimmed milk	1 cup	240	281
Low fat milk		240	300
Hi-calcium skimmed milk		240	396
Hi-calcium low fat milk		240	408
Calcium-fortified soymilk		240	408
Calcium-fortified oat drink		240	288
Calcium-fortified unsweetened almond milk		240	451
Calcium-fortified Unsweetened rice milk		240	288
Goat milk		240	463
Condensed milk		1 tablespoon	13
Full cream evaporated milk	1/8 can	50	128
Filled evaporated milk	1/8 can	50	110
Plain fat free yogurt	1 small cup	150	258
Fruit flavored low fat / fat free yogurt	1 small cup	125	190
Whole milk	1 cup	240	264
Vanilla ice cream	1 small cup	100	100
Cheddar cheese	1 slice	28	202
Swiss cheese	1 slice	28	221
Mini babybel cheese	1 piece	21	150

Vegetables

	Portion	Weight (g)	Calcium (mg)
Chinese spinach, cooked	1 bowl	120	250
Spinach, cooked		160	220
Kale, cooked		160	160
Watercress, cooked		124	150
Choy Sum, cooked		160	145
Bok Choy, cooked		140	130
Bean Sprouts, cooked		120	98
Cabbage, cooked		162	80
Broccoli, cooked		130	52
Sweet Potato, skinless, cooked		190	51
Pumpkin, skinless, cooked		226	50
Carrot, skinless, cooked		160	50
Wintermelon, cooked		222	40
Lettuce, cooked		144	35
Cucumber, cooked		160	29
Tomato, cooked	1 small	126	14
Potato, skinless, cooked	1 bowl	200	8

Fruits

Calcium content in descending orders (mg) (Per 10g carbohydrate portion)

Orange (1 small) 40mg, Dried figs (1 piece) 31mg, Green kiwi (1 piece) 26mg, Papaya (½ bowl) 24mg, Strawberries (8 pieces) 20mg

Dried prunes (3 pieces) 12mg, Plum (2 small) 12mg, Nectarine (1 piece) 10mg, Cherries (10 pieces) 10mg, Watermelon (1 bowl) 10mg, Dragon fruit (½ piece) 8mg

Apple (1 small) 6mg, Pear (½ piece) 6mg, Grapes (10 pieces) 5mg

Pomelo (3 slices) 4mg, Banana (½ medium) 4mg, Blueberries (½ pack) 4mg

Sources:

U.S. Department of Agriculture, Agricultural Research Service. FoodData Central, 2019. fdc.nal.usda.gov.

The Government of Hong Kong Special Administration Region, Centre for Food Safety, Food Search Product labels

Meat, Fish, Poultry & Alternatives

	Portion	Weight (g)	Calcium (mg)
Canned mackerel with bones	1 can	169	407
Tiger prawn	4 pieces	100	403
River prawn	4 pieces	100	325
Shrimp skin	2 tablespoons	30	297
Canned pink salmon with bones	½ can	105	290
Canned sardines with bones in tomato sauce	1 can	120	288
Sea crab	1 crab(3.5 taels)	130	270
Stone snails	10 pieces	10	248
Sea cucumber, soaked	1 piece	100	240
Black beans	5 tablespoons	100	224
Clove fish, dried	2 tablespoons	10	213
Shrimp, dried	10 pieces	38	210
Spiced tofu, dried	1 piece (4cm x 4cm)	25	183
Vegetarian chicken	3 thick slices	51	160
Firm tofu	⅓ block	100	106
Canned baked beans in tomato sauce	4 tablespoons	152	85
Edamame (green soy beans), cooked	½ bowl	50	72
Sea shrimp	4 pieces	24	35
Egg	1 large	52	28

Nuts, Seeds, and Their Products

	Portion	Weight (g)	Calcium (mg)
Sesame, raw, roasted	3 tablespoons	30	297
Sesame seed spread	2 tablespoons	32	308
Tahini sesame seed spread	2 tablespoons	32	134
Almond, dried roasted, raw	1 tablespoon (16 pieces)	24	64
Walnuts	3 pieces	24	25
Chia seed, dried	2 tablespoons	28	177
Flax seed powder	1.5 tablespoons	20	47