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Materials provided for Missoula OsteoStrong Strong Talk – "Reversing Osteoporosis"
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Sources of Calcium (From NIH.gov website)

Food

In the United States, approximately 72% of calcium intakes come from dairy products and foods with added dairy ingredients. Foods fortified with calcium in the United States include many fruit juices and drinks, tofu, and ready-to-eat cereals.

Calcium absorption varies by type of food. The absorption of calcium from dairy products and fortified foods is about 30%. Certain compounds in plants (e.g., oxalic acid, phytic acid) can decrease calcium absorption by forming indigestible salts with calcium, decreasing its absorption. As a result, absorption of calcium is only 5% for spinach, whereas it is much higher, at 27%, for milk. In addition to spinach, foods with high levels of oxalic acid include collard greens, sweet potatoes, rhubarb, and beans. The bioavailability of calcium from other plants that do not contain these compounds—including broccoli, kale, and cabbage—is similar to that of milk, although the amount of calcium per serving is much lower. When people eat many different types of foods, these interactions with oxalic or phytic acid probably have little or no nutritional consequences. Net absorption of dietary calcium is also reduced to a small extent by intakes of caffeine and phosphorus and to a greater extent by low status of vitamin D.

A variety of foods and their calcium content are listed in Table 2.

Table 2: Calcium Content of Selected Foods

Food	Milligrams per serving	Percent DV*
Yogurt, plain, low fat, 8 ounces	415	32
Orange juice, calcium fortified, 1 cup	349	27
Yogurt, fruit, low fat, 8 ounces	344	27
Mozzarella, part skim, 1.5 ounces	333	26
Sardines, canned in oil, with bones, 3 ounces	325	25
Milk, nonfat, 1 cup**	299	23
Soymilk, calcium fortified, 1 cup	299	23
Milk, whole (3.25% milk fat), 1 cup**	276	21
Tofu, firm, made with calcium sulfate, ½ cup***	253	19

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Table 2: Calcium Content of Selected Foods

Food	Milligrams per serving	Percent DV*
Salmon, pink, canned, solids with bones, 3 ounces	181	14
Cottage cheese, 1% milk fat, 1 cup	138	11
Tofu, soft, made with calcium sulfate, ½ cup***	138	11
Soybeans, cooked, ½ cup	131	10
Breakfast cereals, fortified with 10% of the DV for calcium, 1 serving	130	10
Spinach, boiled, drained, ½ cup	123	9
Frozen yogurt, vanilla, soft serve, ½ cup	103	8
Turnip greens, fresh, boiled, ½ cup	99	8
Kale, fresh, cooked, 1 cup	94	7
Chia seeds, 1 tablespoon	76	6
Chinese cabbage (bok choi), raw, shredded, 1 cup	74	6
Beans, pinto, canned, drained, ½ cup	54	4
Tortilla, corn, one, 6” diameter	46	4
Sour cream, reduced fat, 2 tablespoons	31	2
Bread, whole wheat, 1 slice	30	2
Kale, raw, chopped, 1 cup	24	2
Broccoli, raw, ½ cup	21	2
Apple, golden delicious, with skin, 1 medium	10	0

* DV = Daily Value. The U.S. Food and Drug Administration (FDA) developed DVs to help consumers compare the nutrient contents of foods and dietary supplements within the context of a total diet. The DV for calcium is 1,300 mg for adults and children age 4 years and older.
** Calcium content varies slightly by fat content; the more fat in the food, the less calcium it contains.
*** Calcium content is for tofu processed with a calcium salt. Tofu processed with other salts does not provide significant amounts of calcium.

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Dietary supplements

Calcium

The two most common forms of calcium in supplements are calcium carbonate and calcium citrate.

-Calcium carbonate (40% by weight elemental calcium:

1. Requires stomach acid for absorption, so best to take with food
2. Could have mild constipation or feeling bloated, but most people tolerate well

-Calcium citrate (21% by weight elemental calcium):

1. Less dependent on stomach acid for absorption, so it can be taken on empty stomach
2. Better absorbed by people who are on acid reducing medications.

-Other calcium forms in supplements include calcium sulfate, ascorbate, microcrystalline

Absorption from supplements is highest with doses of 500 mg or less. For example, the body absorbs about 36% of a 300 mg calcium dose and 28% of a 1,000 mg dose.

Vitamin D_3

-Improves intestinal calcium absorption. 800 IU are recommended daily for optimal calcium absorption. Because Vitamin D plays many roles in the body, you may need higher amounts for optimal health (based on lab results).

-Sources: Salmon, Herring and sardines, Cod liver oil, Canned tuna, Egg yolks, Mushrooms, Vitamin D-fortified foods

Vitamin K_2

- Usually as MK-4 (pastured eggs, grass fed butter/meat/cheeses) or MK-7 (fermented soybean)

-MK-7 (well absorbed) Prevents arterial calcification and may reverse existing calcification and restore flexibility and elasticity to vessels. It allows for free-floating calcium in the blood to be taken to the bone for bone building, thus reducing the risk of cardio vascular disease. Daily dose of anywhere from 75 – 375 mcg.

-MK-4 Several studies has shown improvement in bone density with doses of 45mg daily.

-Caution if on Warfarin

Magnesium

-In the human body, 60% is found in the bone.

-Essential cofactor for vitamin D synthesis and activation

-A cofactor in more than 300 biochemical reactions in the body (normal nerve and muscle function, supports immune system, helps bones remain strong,sleep, etc…)

-Food sources: Fruits (bananas, dried apricots, avocados), nuts (almonds, cashews), legumes, whole grains, milk.

-Caution in decreased kidney function

-Magnesium Gluconate and Glycinate are well absorbed and have less laxative effect.

Zinc and Vitamin C –

Low levels of both have been linked to osteoporosis

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Boron
(3 mg/day) Important for calcium metabolism
(whole fruits, vegetables, nuts, avocados almonds, cashews, dates, prunes, peanuts, lentils)

Isoflavones
-Source: Soybeans (most concentrated), legumes, grains, vegetables
-Maintain bone health by regulating osteoblast and osteoclast functions
-Caution: Is a phytoestrogen so which may want to be avoided with history of/has breast cancer

Other Dietary Considerations
-Adequate protein: Aim for 1.0 to 1.2 grams/kg body weight daily. More or less may be needed depending on weight, age, activity level.
-Collagen peptides – Good quality bone broth (both collagen and gelatin), powders