Calcium Without Dairy

Thank you for your interest in ***Calcium Without Dairy.***
This nutritional educational packet contains a 6 page study guide, as well as a self test/training certificate, which fulfills one hour of training. This certificate is only valid if the self-test on the backside is completed. You are expected to review the enclosed materials thoroughly prior to completing the self-test. Answers to all questions are contained in the accompanying study guide.

Remember, the training certificate is only valid after review of the enclosed materials and completion of the self test.

If you have any questions as to the proper use of this packet, please contact the ICCB office and we will be glad to assist you.

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There are many children, as well as adults, who have trouble with milk and other dairy products. This may be due to a milk allergy, lactose intolerance or general sensitivity to milk. The symptoms may be mild to severe but definitely unpleasant enough for many to avoid milk and other dairy products at all costs.

One minor problem with an elimination of milk and/or dairy products is that they are a wonderful source of calcium! And there is no doubt that dietary calcium is essential for good health. According to the National Institutes of Health (NIH), the body maintains a constant level of calcium in the body fluid to support the many body functions for which calcium is necessary:

a) muscle contraction
b) blood vessel contraction and expansion
c) secretion of hormones and enzymes
d) sending messages through the nervous system.

That means it's needed to keep your heart beating and your muscles functioning, among other things. But the calcium in body fluids and muscles accounts for only about 1% of the total calcium in your body. The rest of it is stored in the bones and teeth, where it provides structural support and acts as a sort of "savings account" from which calcium is repeatedly withdrawn and deposited.

Although calcium intake is important throughout life, the most important time for building up this savings account balance is during childhood, when there is a higher amount of bone formation and less breakdown. It is estimated that a person's bone strength is at it's peak in the late teens to early twenties. Afterwards, during adulthood and into the senior years, the breakdown takes over as the predominate process, which leads to weakening of the bones. For this reason it is extremely important that the raw materials for bone formation are present and in sufficient quantities for this ongoing process. These elements are calcium, phosphorus and vitamin D.

CURRENT RESEARCH - ON PROTEIN INTAKE AND CALCIUM

One thing that is bothering nutrition scientists in the United States is that despite our higher intake of dairy products we have a much higher rate of osteoporosis than some other countries, *Japan for example*. The Japanese calcium intake has only recently risen to 540 mg per day, much less than the US RDA for post-menopausal women of 1,200 mg per day. And yet the US hip fracture rate is twice that of Japan! In fact, research has shown that countries with the highest calcium intake have the highest hip fracture rates. So, research is ongoing to find out how this can be.

Some research has focused on protein intake from animal sources. As we digest animal proteins, the sulfur in them forms acid. A slight, temporary acid over-load—called acidosis—may result. To regain our natural balance of acidity to alkalinity, or pH, in the bloodstream, our bodies must buffer the influx of acid. One possible buffer is calcium phosphate, which the body can borrow from our bones — the body's main storage depot for this essential mineral. One particular study recruited women who eat both animal and plant foods (omnivores) typical of most Americans — and women who only eat plant-derived foods. The results were unexpected.

1 - Bone resorption—in which calcium is taken away from bones via the bloodstream—was the same for the protein eating omnivore women as for vegan women.

2 - Bone formation was significantly less in omnivore women than in vegan women. This happened even though the omnivore women had a higher calcium intake than did the vegan volunteers.

In conclusion, even though bone resorption was the same in both groups of volunteers, the lower amount of bone formation in the omnivore women could lead to a decrease in their bone density.

These findings, if borne out in larger studies, are highly significant. We may find out that ultimate bone health is more dependant on other factors and less dependant on dietary calcium. In the meantime, we will go with the current recommendations of the 2005 Dietary Guidelines for Americans.

CALCIUM NEEDS

The need for calcium changes according to age states the 2005 Dietary Guidelines for Americans:

Table 1: Adequate Intakes (AIs) for Calcium

Age	Male	Female	Pregnant	Lactating
0-6 months	210 mg	210 mg		
7-12 months	270 mg	270 mg		
1-3 years	500 mg	500 mg		
4-8 years	800 mg	800 mg		
9-13 years	1,300 mg	1,300 mg		
14-18 years	1,300 mg	1,300 mg	1,300 mg	1,300 mg
19-50 years	1,000 mg	1,000 mg	1,000 mg	1,000 mg
50+ years	1,200 mg	1,200 mg		

VITAMIN D NEEDS

Table 2: Adequate Intakes (AIs) for Vitamin D *

Age	Males	Females	Pregnancy	Lactation
0-12 months	5 mcg (200 IU)	5 mcg (200 IU)		
1-13 years	5 mcg (200 IU)	5 mcg (200 IU)		
14-18 years	5 mcg (200 IU)	5 mcg (200 IU)	5 mcg (200 IU)	5 mcg (200 IU)
19-50 years	5 mcg (200 IU)	5 mcg (200 IU)	5 mcg (200 IU)	5 mcg (200 IU)
51-70 years	10 mcg (400 IU)	10 mcg (400 IU)		
71+ years	15 mcg (600 IU)	15 mcg (600 IU)		

* Please note that the above requirements for children may be revised with the release of the 2010 Dietary Guidelines for Americans.

MAGNESIUM AND PHOSPHORUS

These minerals are a major component of bones and teeth, second only to calcium. Phosphorus helps to maintain a normal pH (acid-base balance) in the body and generates and utilizes energy. A deficiency of magnesium alters calcium metabolism and the hormones that regulate calcium. Both minerals are plentiful in many foods.

GOOD ALTERNATIVE SOURCES OF CALCIUM

For comparison's sake, keep in mind that a glass of milk, one of the richest sources of calcium, contains about 300 milligrams.

All of the foods in the list naturally contain significant amounts of calcium unless stated that they have been fortified. Recently, food manufacturers have been fortifiying a variety of foods with additional calcium. Perhaps this is in response to our children who are not drinking enough milk and potentially not getting enough calcium. Some of these foods are:

Total
Total Raisin Bran
Total Cranberry Crunch
Total Honey Clusters
Golden Grahams
Instant Oatmeal
Calcium Fortified Bread or English Muffins

So, be sure to read the food's packaging and the Nutrition Facts labels to determine the calcium content. Try to pick more foods that supply a higher percentage of the recommended daily allowance of calcium.

Table 1: Calcium Content of Selected Non-Dairy Foods

Food	Amount	Calcium (mg)
Blackstrap molasses	2 Tbsp	400
Collard greens, cooked	1 cup	357
Tofu, processed with cal. sulfate	4 ounces	200-330
Calcium-fortified orange juice	8 ounces	300
Soy or rice milk, commercial, calcium-fortified, plain	8 ounces	200-300
Commercial soy yogurt, plain	6 ounces	80-250
Turnip greens, cooked	1 cup	249
Tofu, processed with nigari	4 ounces	80-230
Tempeh	1 cup	215
Kale, cooked	1 cup	179
Soybeans, cooked	1 cup	175
Okra, cooked	1 cup	172
Bok choy, cooked	1 cup	158
Mustard greens, cooked	1 cup	152
Tahini	2 Tbsp	128
Broccoli, cooked	1 cup	94
Almonds	1/4 cup	89
Almond butter	2 Tbsp	86
Soy milk, commercial, plain	8 ounces	80

Note: Oxalic acid, which is found in spinach, rhubarb, chard, and beet greens binds with the calcium in those foods and reduces its absorption. These foods should not be considered good sources of calcium. Calcium in other green vegetables, like kale, collard greens, Chinese mustard greens, and Chinese cabbage flower leaves is well absorbed[1,19]. Fiber appears to have little effect on calcium absorption except for the fiber in wheat bran that does have a small effect[20].Sources: Composition of Foods. USDA Nutrient Data Base for Standard Reference, Release 18, 2005 and Manufacturer's information.

CRANKING UP THE CALCIUM

Try some of the following ideas to increase the amount of dietary calcium:

- ❑ Cook a vegetable stir-fry and toss in diced tofu made with calcium sulfate.
- ❑ Add steamed and minced greens like collards and kale to casseroles, soups and stews.
- ❑ Use calcium-fortified non-dairy milk (like soy or rice milk) instead of water in recipes such as pancakes, mashed potatoes, pudding and oatmeal.
- ❑ Stir a drizzle of blackstrap molasses into your oatmeal.
- ❑ Use almond butter instead of peanut butter.
- ❑ Add calcium-rich beans like black-eyed peas to soups, pasta sauces, salads and burritos.
- ❑ Enjoy canned baked beans as a side dish, or mix them into your favorite recipes.

The following tips should also be helpful:

- ❍ Choose foods enriched with calcium. Many cereals and breads have added calcium. Check the labels! Another good choice is fruit juice fortified with calcium. An 8-ounce glass of calcium-fortified apple juice has 100 mg of calcium; fortified orange juice or grapefruit juice has between 300 and 350 mg. Soy milk, a protein-rich drink made from pressed cooked soybeans, doesn't provide a significant amount of calcium, but you can buy a calcium-fortified version.

- ❍ Vegetables such as broccoli, kale, collards, and several other leafy greens are loaded with calcium. (Spinach, however, contains a chemical that keeps the body from absorbing most of the veggie's calcium.) Other foods that can help you meet your calcium needs are cooked beans such as kidney beans, dried figs, and some kinds of nuts (a generous handful of almonds contains about 200 mg). Finally, if you like tuna sandwiches, try occasionally substituting canned salmon or sardines with the bones; both are good sources of calcium, although higher in fat than tuna.

- ❍ Include a calcium-rich food at every meal. If you're relying on diet alone to get enough of the mineral, be sure to eat at least one calcium-packed food at each meal. The body can absorb only about 500 mg of calcium at a time, so the most effective strategy is to take in calcium-rich foods throughout the day.

- ❍ Cover the other bases for your bones. Getting enough calcium isn't all you have to do. There's vitamin D, which helps your body absorb calcium. If you don't drink milk, which is fortified with vitamin D, and you always wear sunscreen *(exposure to sunlight allows your body to produce vitamin D),* you might want to take a multi-vitamin that includes D or make sure your calcium supplement supplies some.

- Monitor your sodium intake. Although the studies are inconclusive, sodium has been shown to increase calcium losses with 5 to 10 mg of calcium lost with each gram of salt eaten. Until more is known about this relationship, limiting sodium to 2300 milligrams/day is suggested for overall good health.

- Consider supplements. If you've "boned up" your diet yet you suspect it's still short on calcium, you may want to take a daily supplement. These are available in a variety of doses and forms. To maximize absorption, don't take more than 500 mg at once and try to pop the pill when you're having a meal or snack.

  The key factor to consider when buying calcium supplements is the amount of elemental calcium the supplements contain. The term "elemental calcium" refers to the amount of calcium in a supplement that's available for your body to absorb.

  If the amount of elemental calcium isn't clearly listed on the label, check the Nutrition Facts label. The amount of elemental calcium will be listed in milligrams (mg) according to "serving size" — generally one or two tablets. The Nutrition Facts label also lists the Percent Daily Value (% Daily Value), which indicates how much one serving provides toward the average daily recommended amount of a given nutrient for most people. For calcium, the % Daily Value is 1,000 mg of elemental calcium.

  When choosing calcium supplements, it's also helpful to note how much calcium is in the serving size listed on the label. This will help you determine the number of tablets you must take to meet your individual needs for calcium. Also look for "USP" or "CL" on the label. Supplements that bear The United States Pharmacopeia (USP) or ConsumerLab (CL) abbreviations meet voluntary industry standards for quality, purity, and tablet disintegration or dissolution.

- Exercise regularly in a way that puts stress on your skeleton -- running, weight lifting, hiking up hills, or jumping rope will keep your bone-building cells at work.

Resources

Agricultural Research Service - USDA
http://www.ars.usda.gov/is/ar/archive/mar03/osteo0303.htm

Mayo Clinic
http://www.mayoclinic.com/health/calcium-supplements/AN00964

Harvard School of Public Health: The Nutrition Source
http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/calcium-full-story/index.html

Calcium Wihtout the Cow: Meeting Your Needs With Little or No Dairy
http://www.vegsource.com/attwood/milk.htm