

Lesson 12 *The Biggest Loser*

Calcium - More than bones and teeth

Most people are aware that calcium is very important for strong bones and teeth. However, the functions of this mineral go well beyond building strong bones and teeth.

Calcium is the most abundant mineral in our bodies. Over 99% of the calcium in our bodies is stored in our bones and teeth where it provides strength and structure. The remaining 1% is found in the blood, muscles and fluid between cells where it is needed for muscle contraction, blood vessel contraction and expansion, the secretion of hormones and enzymes, sending messages through the nervous system, and blood clotting.

The body maintains a constant level of calcium in the blood and tissue so all of these processes can function effectively. If enough calcium is not taken in through the foods and beverages we eat, then the body “borrows” calcium from our bones. If there is a consistent imbalance between the calcium we take in and the calcium our body needs, it will eventually lead to depleted bone stores and osteoporosis – a disorder characterized by porous, weak, and brittle bones.

How much calcium do you need? The amount of calcium we need varies throughout our life time. The greatest need is during periods of growth (during childhood and teenage years), pregnancy, and late in life when our bodies are not as efficient at absorbing calcium. Following is a general guideline of the amount of calcium recommended for different age groups:

Male and Female Age	Calcium (mg/day)
0 – 12 months	270
1-3 years	500
4-8 years	800
9-18 years	1300
19-50 years	1000
51+ years	1200

A large percentage of Americans are not consuming the recommended amount of calcium. According to the Continuing Survey of Food Intakes of Individuals, 44% of boys and 58% of girls ages 6-11, 64% of boys and 87% of girls ages 12-19, and 55% of men and 78% of women over 20 are NOT getting enough calcium.

What foods have calcium? We typically think of dairy foods when we think of calcium, and these foods are great sources. A cup of yogurt provides 415 mg, a cup of milk has about 300 mg and 1 ½ oz. of cheese contains about 275 mg. Dairy foods also give us protein and vitamins D and A.

Calcium is also found in dark green, leafy vegetables such as kale, collard greens, and Chinese cabbage as well as broccoli, dried beans and legumes, and fortified foods including fruit juices, tofu, soy milk and cereals. Be aware that some plant-based foods are high in calcium but contain substances that reduce the amount of that your body can absorb. For example, in order to get approximately the same amount of calcium as in 1 cup of yogurt, you would need to drink 1 cup of milk, or eat 1 ½ oz of cheese, 1 ½ cups of cooked kale, 2 ¼ cups of cooked broccoli or 8 cups of cooked spinach.

What effects how much calcium our body absorbs? The amount of calcium our body absorbs from the foods we eat is affected by a variety of things: our body's calcium status, vitamin D status, our age, the plant substances we eat, and even how much calcium we consume at one time. Calcium is also eliminated from our body. The amount that is excreted is increased when eating high sodium and protein diets, and consuming caffeine and alcohol.

What does Vitamin D have to do with it? Vitamin D is required for our bodies to use the calcium and phosphorus from the foods we eat. It travels to our intestines to encourage more absorption and to the kidneys to minimize the loss of calcium in the urine.

Vitamin D is also called the "sunshine vitamin" because our bodies make vitamin D when we are exposed to sunshine. The ultra violet rays from sunlight trigger synthesis in the skin. The liver and kidneys help convert it to a hormone which is the active form of Vitamin D that helps us utilize the calcium we consume. Vitamin D is a fat soluble vitamin so it can be stored in the blood and fat tissue for several months. However, the time of year, time of day, geographic location, cloudiness, smog or other pollution, use of sunscreen, and the color of our skin can all reduce the amount of vitamin D our bodies can synthesize and can contribute to an insufficient level.

We also get Vitamin D through fortified foods. Prior to the 1940s, rickets (a softening of the bones in children that can lead to deformity) was a major health problem and due to the lack of vitamin D. Since that time, nearly all the milk supply in the US is fortified with vitamin D. Yogurt and some cheese may be fortified as well as ready-to-eat cereals and some grain products. High fat fish, such as salmon and mackerel, as well as tuna or sardines packed in oil are good sources too.

Vitamin K, found mainly in green, leafy vegetables, likely plays a role in calcium regulation and bone formation as well. Low levels have been linked with low bone density, and supplementation has shown improvements in bone health. Getting one or more servings a day of broccoli, Brussels sprouts, dark green lettuce, collard greens, or kale would be enough to get the recommended amount of this vitamin and would also boost your calcium.

Tips to help meet your calcium needs:

- Make a fruit smoothie with low-fat/fat-free yogurt
- Sprinkle low fat cheese on salad, soup or pasta
- Choose low-fat milk over carbonated or other sugary drinks
- Serve raw fruits or vegetables with low-fat/fat-free yogurt based dip
- Add diced calcium fortified tofu to a vegetable stir fry
- Enjoy a parfait of fruit and low-fat/fat-free yogurt
- Choose calcium fortified foods and juices

References:

National Institute of Health, "Dietary Supplement Fact Sheet – Calcium", Updated 4/15/09

Harvard School of Public Health, "The Nutrition Source – Calcium and Milk"

A Healthier Weigh, CSU Extension, Logan and Morgan counties and Golden Plains Area

Congratulations! You have made it through the final *Biggest Loser* lesson. I hope this has been a beneficial program.