Skeleton Crew
Calcium is necessary for much more than just healthy bones. Are you sure you know how to get enough?

As the most abundant and active mineral in the body, calcium is the ultimate utility player: It regulates blood pressure, enzyme activity, muscle contraction and heartbeat; helps blood clot; controls the release of neurotransmitters (chemicals that send nerve impulses); and is believed to reduce symptoms of PMS and the risk of colon cancer. And a new study conducted at Purdue University in Indiana found that 1,000 milligrams (mg) of calcium a day helped prevent weight gain and actually promoted weight loss in women aged 18 to 31.

Think of your bones as the body's calcium bank. Because the mineral is deposited and withdrawn by the body as needed, it's essential for us to get sufficient amounts to build up and maintain these stores. But that can be trickier than it sounds. According to experts, most people don't get the amount of calcium they need. Research from the Framingham Nutritional Studies, published in the Journal of the American Dietetic Association in 1997, estimates that only about half of Americans get the recommended levels (see "Your Magic Number," p. 85, for dosages). Even people who are vigilant about consuming enough calcium may not be absorbing enough. Factors such as lifestyle habits (smoking, poor diet, prescription medication) and nutrient interactions (e.g., iron blocks calcium uptake) play a huge role in inhibiting absorption and, in some cases, actually cause calcium to be leached from the bones.

The main risk associated with a calcium deficiency is osteoporosis, a disease characterized by low bone mass and the structural deterioration of the bones. Yet osteoporosis isn't caused by a lack of calcium, but by its poor absorption in the body and accelerated excretion rates. Nor is osteoporosis an "old woman's" disease. Men and women of all ages are at risk, if not equally so. According to the National Institutes of Health, osteoporosis affects 28 million Americans, 20 percent of whom are men. And every year...
80,000 men and 200,000 women suffer a hip fracture due to osteoporosis, translating into a 20 percent increased risk of death within the year.

**ABSORB IT, STORE IT**

Since almost all the calcium in your body is stored in the bones (the rest circulates throughout the body or is stored in your teeth), it’s important to get a lot of it when your bones are still building rather than deteriorating—which starts happening earlier than you might think. “In adulthood, women’s and men’s bones get more porous and start breaking down as early as age 20,” says Kathy McManus, M.S., R.D., manager of clinical nutrition at Brigham and Women’s Hospital in Boston.

The stockpiling of calcium is an ongoing process, but building your bones to full capacity early in life is your best defense against osteoporosis. Keith Block, M.D., clinical assistant professor at the University of Illinois at Chicago’s College of Medicine, explains that building our bone mass up to 100 percent is crucial since we lose about 20 percent of it as we age. He notes that the people at the greatest risk of a deficiency are teenagers in the process of building their stores; pregnant or lactating women, whose bodies use and therefore require more calcium; people who don’t get enough vitamin D (which is critical for calcium absorption); and those with generally poor diets.

“It’s always best to get calcium from food,” says Block. “That’s the way nature intended it to be used—as part of a total package. The challenge is making sure you get enough from food.” The first step toward building up your stores is eating plenty of calcium-rich foods. Look at your diet and examine the average amount of calcium you get daily (see “Beyond Milk,” below, for some of those amounts). Of course, the trick is getting it absorbed by the small intestine, from which it enters the blood, circulates and is eventually deposited into the bones. Poor eating habits can literally rob your bones of calcium, making a healthy diet more important than singling out calcium intake. “Americans have overly acidic diets because of the amounts of meat, salt, alcohol [and caffeine] they eat and drink,” says Susan Lark, M.D., author of...

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The Chemistry of Success (Bay Books, 1999). She explains that once an acidic environment is created, the body naturally seeks to neutralize that condition and does so by drawing calcium, an alkaline mineral, out of the bones and into the bloodstream. This leaching process leaves less of the mineral available to maintain bone strength.

There are other factors that affect calcium absorption. “People who eat a very high fiber diet may have lower absorption rates,” says McManus. “Phytic acid, found in wheat bran, and the phosphates found in brown rice decrease absorption. But as long as you get calcium from green leafy...

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**Beyond Milk**

Plenty of plant-based foods offer significant amounts of usable calcium.

- **Calcium-fortified fruit juices (1 cup):** 300 milligrams (mg.) (equal to 1 cup milk)
- **Fortified soy milk (1 cup):** 250 to 300 mg.
- **Tofu (¼ cup raw):** 100 to 250 mg.
- **(higher amounts for fortified brands)**
- **Collard greens (¼ cup cooked):** 180 mg.
- **Blackstrap molasses (1 Tbs.):** 170 mg.
- **Figs (5 dried):** 135 mg.
- **Turnip greens (¼ cup cooked):** 125 mg.
- **Kale (¼ cup cooked):** 90 mg.
- **Broccoli (¼ cup cooked):** 68 mg.
- **Almonds (2 Tbs.):** 50 mg.
Your Magic Number

Our needs for calcium change throughout our lives; and although these requirements vary from person to person depending on age, gender and lifestyle, the National Academy of Science’s DRI’s (dietary reference intakes) provide good daily guidelines.

- Women and men 9 to 18 years old: 1,300 milligrams (mg.)
- Women and men 19 to 50: 1,000 mg.
- Women and men over 51: 1,200 mg.
- Pregnant or lactating women under 18: 1,300 mg.
- Pregnant or lactating women over 18: 1,000 mg.

Vegetables, soy and other vegetarian sources, your intake should be sufficient.” Iron is another inhibitor. It’s important to take iron and calcium supplements separately and not to eat iron-rich foods (lentils, kidney and lima beans) with your calcium sources.

Besides getting a healthy, balanced diet, there are specific vitamins and minerals you can take to enhance calcium absorption. Magnesium must be present for calcium to enter the tissues. McManus says that magnesium is not typically deficient in our bodies, yet to maximize calcium make sure you’re getting 1 mg. of magnesium for every 2 mgs. of calcium you take. “Calcium and vitamin D also go hand in hand,” she says. Sunlight is important to the early stages of vitamin D production, so you should take in 400 international units (IU) daily, which you can get from 15 minutes of direct sun with no SPF protection. “Vitamin K [found in green leafy vegetables] is necessary for the production of osteocalcin, which helps attach calcium to bone tissue,” explains Tori Hudson, N.D., director of A Women’s Time clinic in Portland, Ore., and author of The Women’s Encyclopedia of Natural Medicine (Keats, 1999). Vitamin C also aids absorption, so many brands of orange juice, which is naturally high in C, are supplemented with calcium. And finally for optimum utilization of calcium, minute doses of folic acid, vitamin B6, manganese, copper, boron, zinc, silicon and strontium should be present and can be obtained from a good multivitamin/mineral supplement.

While it is essential to get enough calcium, too much can be just as detrimental. “My pet peeve is that when people supplement with calcium, they take the full amount they think they need, forgetting that they are also getting calcium in their diet,” says Hudson. High doses (more than 2,500 mg. daily) can lead to constipation, kidney stones and, in extreme cases, kidney failure. “We want to make sure people are getting adequate amounts,” says McManus, “but we don’t want them to be taking supplements indiscriminately.”

DO YOU NEED TO SUPPLEMENT?
The best-known sources of calcium are dairy products, but there are a number of plant-based choices. Dark leafy greens (like kale and chard) are wonderful sources. “Calcium from kale is much more easily absorbed by the body than milk,” says Hudson. But some plant sources, such as spinach and asparagus, contain oxalic acid, which actually impedes absorption.

With a little effort, you can get the dietary reference intakes (DRI) of calcium from diet alone. However, if you’re concerned that you are not getting enough on a regular basis and do opt for supplementation, you have several choices. “The best way to supplement is with a combination of calcium citrate and calcium malate,” says McManus. “This kind of calcium, found in fortified foods, is easier to absorb than the more common calcium carbonate.” (Calcium dolomite is also difficult to absorb.) Supplements are most effective in doses of 500 mg. or lower, so it’s a good idea to take your total in divided doses, throughout the day, between meals. (But beware of calcium supplements that say “natural”; they are often made with oyster shell or bone meal and may be contaminated with toxic heavy metals, such as lead.) Here’s a simple test to help you determine whether your calcium supplement is being properly utilized by your body. Drop a pill into a 6-ounce glass of vinegar, stir and wait for 30 minutes. “If it doesn’t dissolve,” says McManus, “it probably isn’t being absorbed by your body. In general, if a supplement is coated, it probably won’t get into your system.”

Maintaining adequate calcium stores in your bones requires balancing a number of factors. But as daunting as that may seem, the payoffs—strong bones, normal nerve function, a healthy heart—make the juggling act well worth the effort.

Mary Jane Horton is associate editor of Fit Pregnancy magazine.