

## NUTRITION

### Healthy Eating for Healthy Bones

**A**s we get older, we often pay less attention to our diet. We may live alone and not always bother cooking a meal. We may become less active as we age, which can also reduce our appetite. Grocery shopping may become more difficult so we do less of it. The result is that we soon run out of items like milk, yogurt and fresh fruit and vegetables. The next thing you know, some tea and toast is all we really have left, or care to prepare.

The purpose of this fact sheet is to help you plan your diet and your grocery shopping so that your bones will stay as healthy and strong as possible. You have no doubt heard that calcium and vitamin D are good for your bones. They are, but they are not the only important nutrients. A well balanced diet, made up of all the four food groups in Canada's Food Guide, is the secret to healthy bones. (For Canada's Food Guide, go to [www.hc-sc.gc.ca](http://www.hc-sc.gc.ca).)

### MEAT AND ALTERNATIVES

In addition to calcium and other minerals, bone is made up of protein, a nutrient that is necessary for building and repairing body tissues including bones. Protein gives bone its strength and flexibility. Protein is also the big component of muscles, which are, of course, crucial for mobility and in preventing falls. The "Meat and Alternatives" food group provides your body with protein. Meat and alternatives also contain other vitamins and minerals that are essential for overall good health.

How do you know how much protein you need? Canada's Food Guide recommends 2 - 3 servings of meat or alternatives each day for those over 50. A serving size is about the size and thickness of



your palm (excluding the thumb and fingers). This means that you should eat a palm size portion of protein with at least two of your three meals. The "Meats" include beef, pork, poultry and fish. The "Alternatives" include beans, lentils, tofu, egg whites, peanut (or other nut) butters, shelled nuts and seeds. Dairy products are also a good source of protein and have the added advantage of being good sources of calcium.

Too many seniors don't eat enough protein or other important nutrients. Less protein means more fragile bones. Less protein also means weaker muscles. Weaker muscles lead to poorer balance and more falls, and falls can lead to fractures. It is not unusual to find that people who break a bone also had a deficiency of protein in their diet over a period of several months just before their fracture. So, put some turkey slices or light peanut butter on your morning toast; have a boiled egg or a salmon sandwich with your lunch, a chicken breast or a home-made hamburger patty with your supper. Eat well and eat regularly.

## VITAMIN D: AN IMPORTANT NUTRIENT THAT PROTECTS YOU AGAINST FALLS AND FRACTURES

Vitamin D is very important for bone health. It helps build stronger bones, partly by increasing the absorption of calcium. Vitamin D also improves the function of muscles, which in turn improves your balance and decreases the likelihood of falling. Vitamin D is therefore doubly essential in helping protect you against fractures.

Vitamin D comes from the sun. The sun's rays interact with our skin to produce vitamin D that can be used for bone and muscle health. In Canada, because we live in a northern climate, we don't get as much sun as we need; and when we apply sunscreen in the summer, that disables the skin's ability to produce vitamin D from sun exposure. Additionally, as we age, the skin's ability to

## THE PROTEIN CONTROVERSY

Some groups claim that North Americans, who have a diet high in protein and dairy products, are at greater risk of osteoporosis and fractures than people who live in countries where meat and dairy products are not a large part of the diet. The reasoning behind this claim is that meat and dairy products contain protein, and excess protein can contribute to bone loss.

However, rarely do seniors eat too much protein. The opposite is, in fact, more commonly the truth. In most people who fracture, it is not too much protein that is the problem; it is, more often than not, too little protein. Many studies show that women and seniors do not consume enough protein daily. In fact, in the elderly, protein deficiency may be an important problem for bone health. Excessive amounts of protein are not a concern for most people and will only promote bone loss if calcium intake is not adequate.

In addition, there are no studies showing that drinking milk causes bone loss. Indeed, the opposite is true: more dairy means greater bone mass and therefore stronger bones.

make vitamin D decreases and for all of these reasons, many Canadians are low on vitamin D.

There are very few food sources of vitamin D. In fact, it is impossible for adults to get sufficient vitamin D from diet alone, no matter how good their nutrition. **Therefore, Osteoporosis Canada recommends routine vitamin D supplementation for all Canadian adults year round.** Healthy adults between 19-50 years of age, including pregnant or breast feeding women, require 400 - 1,000 IU daily. Those over 50 or those younger adults at high risk (with osteoporosis, multiple fractures, or conditions affecting vitamin D absorption) should

receive 800 - 2,000 IU daily. These amounts are safe. Taking more than 2,000 IU of vitamin D daily should be done only under medical supervision.

The best way to ensure that you are getting sufficient vitamin D is by taking a supplement. The type of vitamin D you should purchase is vitamin D3 (also called cholecalciferol). This is the most common type of vitamin D found in supplements in Canada.

Vitamin D by itself comes in 400 and 1000 IU tablets. Most multivitamins contain some vitamin D but the amounts vary quite a bit, so be sure to read the small print on the label carefully.

There is something special about vitamin D that does not apply to most other vitamins or supplements. Vitamin D is fat soluble. This means vitamin D can be “made up.” If you miss your vitamin D today, for example, you can take double the amount tomorrow. If you miss your vitamin D for a whole week, you can take all the vitamin D that you missed altogether at the end of the week. However, you shouldn’t do this on a regular basis without consulting your physician and this can only be done with vitamin D. **It cannot be done with other medications or supplements.**

Some calcium supplements also contain vitamin D3 and again the amounts vary. If you are unclear how much vitamin D your supplements contain, please check with your pharmacist.

## CALCIUM: AN IMPORTANT NUTRIENT THAT BUILDS STRONGER BONES

Bone is living tissue, constantly renewing itself. Although bone is strong and relatively flexible, everyday wear and tear causes tiny structural defects, much like those that occur in the foundations of a building over time. In our bodies, there are two groups of special cells that perform the work of a “maintenance crew.” Osteoclasts excavate any areas of damaged or weakened bone and then osteoblasts fill in the crevices with material that hardens to form new bone. This two-part process is called bone remodelling, and the cycle of remodelling is completed every three to four months in a healthy young adult.

As we age, the two groups of cells that form the maintenance crew become less efficient in

HOW MUCH CALCIUM DO WE NEED?	
Age	Daily Calcium Requirement (this includes your diet and supplements)
19 to 50	1000 mg
50+	1200 mg
pregnant or lactating women 18+	1000 mg

working together - the osteoclasts remove old bone faster than the osteoblasts are able to rebuild it. In addition, calcium, like many nutrients, is absorbed less effectively as we age. In people who have relatively healthy bones, adequate calcium intake can help the remodelling process stay balanced. Studies of older adults show that adequate calcium intake can slow bone loss and lower the risk of fracture.

For those over 50, Canada’s Food Guide recommends 3 servings of milk and alternatives (2 servings for adults under age 50) - yogurt, cheese, calcium-fortified beverages, puddings, custards, etc. This essentially means that,

if you are over 50, you need the equivalent of one good serving of dairy at each meal.

Take your pick: have a glass of milk (make it chocolate milk if you prefer), have soup that’s made with milk (like cream of mushroom soup), main courses made with low fat cheese such as lasagna, or have low fat yogurt with fruit for dessert. A 3 cm cube of hard cheese has as much calcium as a cup of milk. Skim milk products provide as much calcium as whole milk with the added advantage of less fat and cholesterol. Dairy products are an excellent source of calcium and are also a good source of protein.

If you are intolerant to dairy products or if you prefer to avoid dairy, there are other food sources that are high in calcium. These include:

- calcium-fortified soy, almond and rice beverages (check the nutrition labels)
- calcium-fortified orange juice (check the nutrition labels)
- canned salmon or canned sardines. (When you eat the bones that have been softened by the canning process, these foods are excellent sources of calcium.)

What should you look for on the nutrition labels? One cup of cow’s milk has about 300 mg of calcium. On the nutrition label, this is specified as 30% of daily value for calcium. If a cup of calcium-fortified orange juice or soy, almond or rice beverage has about the same % value of calcium (close to 30%), then that product can be considered a good alternative to dairy in terms of calcium content.

## HOW DO I KNOW IF I NEED A CALCIUM SUPPLEMENT?

Osteoporosis Canada strongly recommends that everyone obtain their calcium through nutrition whenever possible. Even if you take excess calcium from your diet, that is not harmful. However, some individuals just can't seem to get enough calcium in their diet. These persons may need to take a calcium supplement, but this should be discussed with a physician as calcium supplements can have some side effects and have been associated with some risks.

To know whether or not you need to take a calcium supplement, you really need to figure out how much calcium you are getting in your diet. Here is a very simple way to calculate this.

First, give yourself a baseline of 300 mg of calcium simply for eating anything at all. This is because there is a small amount of calcium in a variety of foods such as breads, muffins, oranges, etc. At the end of the day, even without eating any high calcium foods, you can't help but get about 300 mg of calcium in your daily diet.

Now, add another 300 mg for any of the following high calcium foods:

- 1 cup (250 ml) of cow's milk or goat's milk (including whole milk, 2%, 1%, skim or chocolate milk)
- 1 cup (250 ml) of fortified soy, almond or rice beverage
- 1 cup (250 ml) of fortified (or calcium rich) orange juice
- $\frac{3}{4}$  cup of yogurt (175 ml)

## THE TRUTH ABOUT LACTOSE INTOLERANCE

Avoiding milk and other dairy foods because of lactose intolerance can have serious effects on nutrient intake, including lowering the intake of calcium, which leads to an increased risk of osteoporosis and fracture. Here are some tips to help you lessen the symptoms of lactose intolerance:

- Try to consume small amounts of milk and other dairy products more frequently throughout the day rather than having fewer, larger servings of dairy.
- Consume milk and milk products with meals.
- Consume milk and milk products every day. This may reduce the symptoms, because the bacteria in the gut get used to the lactose and less gas may be produced.
- Try lactose-free or lactose-reduced milk and other dairy products; a glass of lactose-free milk provides the same nutrients as regular milk.
- Enjoy hard cheeses such as Swiss, Edam, Gouda and Cheddar, which contain very little lactose. There are some lower fat cheese alternatives.
- Choose yogurt. The bacteria in some yogurts may help break down the lactose it contains.
- Try Kefir (a fermented milk drink). It may be better tolerated.
- Use lactase drops/tablets (available at a pharmacy) in milk to reduce the lactose content.

- 2 slices of cheese
- one chunk of cheese (a 3 cm cube)
- salmon, canned with bones (1/2 can or 107 g) or sardines, canned with bones (7 medium or 84 g).

Three servings of any of the above will give you about 900 mg of calcium, and if you add the 300 mg of baseline calcium for eating

anything at all, this will ensure the 1200 mg of calcium you need if you are over 50. Don't forget to add in any calcium you might be getting from a multivitamin tablet.

If you are already getting close to the recommended amount of calcium for your age group, then you are doing great. Your body needs calcium and you are already

# WHEN YOUR DOCTOR ADVISES YOU TO TAKE A CALCIUM SUPPLEMENT

If you find it difficult to obtain the recommended amounts of calcium through diet alone, your physician may recommend a combination of foods rich in calcium and a low dose calcium supplement as a good strategy for you. Calcium supplements are tablets, capsules or liquids containing the mineral calcium from a non-food source. Many brands of calcium supplements are available. When making a choice, take the following factors into consideration:

## THE AMOUNT OF CALCIUM PER TABLET OR DOSE

The product label should state the amount of elemental calcium in each tablet, e.g., 300 mg of elemental calcium in a 750 mg tablet of calcium carbonate. The amount of elemental calcium is the figure you use to calculate your true daily intake from a supplement.

## PRICE

The most expensive preparations are not necessarily better. Costs will vary among brand name products and similar generic supplements. Prices may also vary with the amount of elemental calcium per tablet. Compare brands and prices.

## SIDE EFFECTS

For some, calcium supplements may cause stomach upset, constipation or nausea. Try different brands or forms, e.g., gelatine capsules,

chewable calcium or effervescent tablets, to find a suitable product for you. Calcium citrate may be a good alternative to calcium carbonate.

## SAFETY

Specific Canadian standards have been established for lead content, quality, and disintegration; products with DIN (Drug Identification Number) or NPN (Natural Product Number) numbers have passed these tests. If you have any doubts, ask your pharmacist to recommend a good calcium supplement for you.

## TABLET SIZE

Some calcium tablets are very large and may be difficult to swallow. If this is a problem for you and you can't see the tablet through the bottle, ask your pharmacist or sales person about tablet size. You may wish to inquire about chewable or effervescent tablets or calcium in a gelatine capsule form. In addition, calcium tablets that also contain vitamin D tend to be larger in size. If size matters to you, take your calcium and vitamin D separately rather than in a combined form.

## HOW TO TAKE A SUPPLEMENT

To maximize the absorption of calcium:

1. Take calcium carbonate with food or immediately after

eating. It is absorbed more effectively when there is food in the stomach. Calcium citrate, calcium lactate and calcium gluconate are well absorbed at any time.

2. Take calcium with plenty of water.
3. Take no more than 500-600 mg of elemental calcium at one time. In fact, it is best to take smaller doses more frequently rather than large doses once a day.
4. Antacids are an acceptable source of calcium. The calcium in these products is calcium carbonate and should be taken at mealtime for better absorption.

## BE SURE ABOUT YOUR DOSE OF SUPPLEMENTAL CALCIUM

Only take a calcium supplement if your doctor has advised you to do so. Unless you are very confident that you are taking the correct dose, show your bottle of calcium to your doctor or pharmacist to be sure that you are not taking too much calcium, which may be harmful. If you change the brand of calcium supplement you are taking, you may need to show the new bottle to your doctor or pharmacist again, to make sure that your dose of calcium has not changed.

getting the calcium you need from your diet.

Extra *dietary* calcium is not harmful. However, getting more calcium than you need from *supplements* can be harmful. Excess calcium from *supplements* has been associated with kidney stones, heart problems, prostate cancer, constipation and digestive problems. **Do not take extra calcium from supplements if your diet is already giving you enough calcium.**

If you are not getting or cannot get the recommended amount of calcium for your age group from your diet, or if you are not certain if your diet is giving you enough calcium, then you should discuss whether you need to take a low dose calcium supplement with your doctor. You should not just arbitrarily take a calcium supplement on your own.

## DAIRY AND CHOLESTEROL

Some people avoid dairy products altogether because they worry about cholesterol. If you are one of these people, you should know that there are lots of low fat dairy products you can eat that

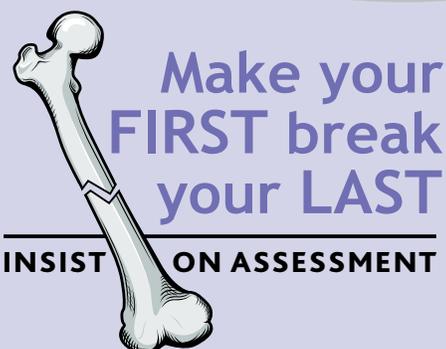
will not raise your cholesterol. These include skim and 1% milk, low fat yogurt, 1% or 2% cottage cheese and 4% and 7% cheese.

For comparison, mozzarella cheese made from skim milk has about 17% fat and regular mozzarella has about 24% fat, so the dairy products we listed above are very, very low in fat, indeed, and do not pose a risk to one's cholesterol levels. Read food nutrition labels to be sure.

## OTHER IMPORTANT FOODS FOR BONE HEALTH

Few people realize how important **fruits** and **vegetables** are for healthy bones. Fruits and vegetables provide many nutrients that are important for your bones such as vitamin C, vitamin K, potassium, magnesium, phytoestrogens and antioxidants. Try to include at least seven servings of fruits and vegetables every day. Eat a variety of colours of fruits and vegetables. Eat orange and dark green vegetables and vary the colour of your fruits as well. Choose fresh fruits over fruit juice, which is very high in

sugar, even if it is unsweetened. To round out your balanced diet, be sure to include whole grain products every day. Avoid sugary foods and simple carbohydrates. Try to eat natural foods (beans, peas, brown rice) rather than processed foods (sweets, fast foods). Follow Canada's Food Guide and you are well on your way to building and maintaining healthy bones.



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## OSTEOPOROSIS

The information contained in this fact sheet is not intended to replace medical advice. Readers are advised to discuss their individual circumstances with their physician.

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