Counting the Calcium*

Purpose

To calculate the amount of calcium in your diet

Materials

Calcium Calculator Worksheets (p. 51)
pen or pencil
science journal
calculator (optional)
computer with Internet access

Background

Calcium is necessary to build strong bones and teeth, regulate the heartbeat, clot the blood, maintain proper thyroid function, and help transmit nerve impulses. Calcium is the most abundant mineral in the human body. The teeth and bones contain 99% of the body's calcium. Because new bone is constantly being formed and broken down, the body needs a regular calcium supply. Peak bone growth occurs between the ages of 12 and 25. Getting the recommended daily amount of calcium is critical during these growing years, but the body never outgrows its need for calcium.

Osteoporosis is a disease in which bones become weak and fragile. Because the bones are not as strong, they are more likely to break. These breaks, or fractures, usually occur in the hips, spine, and wrists. Often these breaks are very painful and do not heal fully. Getting the daily recommended amount of calcium early in life can help prevent the development of osteoporosis. Unfortunately, the National Health Institute reports that only 19% of teenage girls and 52% of teenage boys are getting the recommended amounts of calcium per day.

Vitamin D is also important to healthy bone growth. Vitamin D helps the body absorb the calcium that is consumed. Milks and cereals (and some orange juice) are fortified with vitamin D. A fortified food is one that has had nutrients added to it. Although some foods contain vitamin D, most of the vitamin is made in your skin when you are exposed to sunlight. Once vitamin D is produced in the skin or consumed in food, it requires chemical change in the liver and kidney to form its active hormone form. Active vitamin D functions as a hormone because it sends a message to the intestines to increase the absorption of calcium. If you don't get enough vitamin D, your body is deficient in the vitamin and will not be able to use the calcium from food to build strong bones and teeth.

In space, astronauts may lose 20% of the calcium in their bones on long-duration space flights. Because the shuttle and the International Space Station are shielded to prevent crewmembers from being exposed to the Sun's rays, the crewmembers must consume vitamin D during space flight and eat foods that replace the lost calcium.

Procedure

1. For one day, keep a log of all the foods you eat and their portion sizes. Be sure to also include drinks in your log.
2. Use the Calcium Calculator Worksheet to identify any calcium-rich foods noted in your log.
3. Estimate the number of portions you ate for each food.
4. Total the number of portions in each category.
5. Multiply this number by the milligrams of calcium per serving.
6. Enter this amount in the box in the far right column.
7. Total the amounts in the boxes.
8. Record your calcium intake and your recommended daily allowance of calcium.
9. Compare your calcium intake to your calcium need.

Discussion

1. Why is calcium important to the body?
2. What are some common calcium-rich foods?
3. What role does vitamin D play in healthy bone development?
4. From what two sources do we get vitamin D?
5. What can you do to add more calcium to your diet?

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Extensions

1. In this activity the amount of calcium in each food is an estimate, rounded for easy calculation. To find a more exact estimate of your calcium intake, conduct an Internet search for an online calcium calculator. Many dairy council sites include kid friendly calculators.
2. Design a series of daily menus that feature calcium-rich foods. Be sure to include some healthy calcium-rich snacks.
3. Launch a public service campaign to help make people aware of the need for calcium. You might write a commercial for your school announcements or make posters to hang in the school cafeteria. Contact your public broadcasting station or local radio station to see if they will allow you to put your announcement on the air.

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CALCIUM CALCULATOR WORKSHEET

Check your food log and identify any calcium rich foods you ate from the Daily Calcium Needs table. Estimate the number of portions for each food you checked in the table. Total the number of portions and multiply by the milligrams of calcium per serving.
Put the total in the box at the far right and then add the amounts in these boxes. This final total is your estimated calcium intake.

Daily Calcium Needs

Age:				
	1–3 years	500 mg	4–8 years	800 mg
	9–18 years	1300 mg	19–50 years	1000 mg *
	51 + years	1200 mg		

NOTE: *The Recommended Daily Allowance is based on the amount of calcium needed for this age group. If you are younger or older, you may need to revise the amount of calcium in your diet.*

Calcium-rich Foods	Portion Size	# of portions yesterday	mg of Calcium per portion		Total mg of Calcium
____ Bagel	1	_____			
____ Bread	2 slices	_____			
____ Broccoli, cooked	¾ cup	_____			
____ Beans (Kidney, Lima)	1 cup	_____			
____ Corn tortilla	1	_____			
____ Kale, cooked	½ cup	_____			
____ Lentils	1 cup	_____			
____ Orange (fruit, not juice)	1 med.	_____			
	Total	_____	**x 50 mg**	=	**mg**
____ Bok choy	½ cup	_____			
____ Chickpeas	1 cup	_____			
____ Cottage cheese	½ cup	_____			
____ Ice Cream	½ cup	_____			
____ Parmesan cheese	1 Tbsp	_____			
____ Almonds	¼ cup	_____			
____ Eggs	2 whole	_____			
	Total	_____	**x 75 mg**	=	**mg**
____ Baked beans	1 cup	_____			
____ Cheese pizza	1 slice	_____			
____ Ice milk, Frozen yogurt	½ cup	_____			
____ Pancakes, Waffles *(made with milk)*	3 med.	_____			
____ Pudding *(with milk)*	½ cup	_____			
____ Soft and semi-soft cheeses *(such as mozzarella)*	1 ¼" cube	_____			
____ Soup made with milk	1 cup	_____			
____ Calcium enriched Cereal	1 cup	_____			
	Total	_____	**x 150 mg**	=	**mg**
____ American cheese	2 slices	_____			
____ Firm cheeses (such as cheddar, Swiss)	1 ¼" cube	_____			
____ Processed cheese	2 slices	_____			
____ Salmon, canned with bones	½ can	_____			
____ Sardines, canned with bones	½ can	_____			
____ Yogurt, fruit flavored	¾ cup	_____			
____ Macaroni and cheese	1 cup	_____			
	Total	_____	**x 250 mg**	=	**mg**
____ Milk, skim, 1%, 2% Whole, buttermilk, or chocolate	1 cup	_____			
____ Calcium-fortified beverages, e.g., soy, rice milk	1 cup	_____			
____ Orange juice with added calcium	1 cup	_____			
____ Ricotta cheese	½ cup	_____			
____ Skim milk powder	1/3 cup	_____			
____ Tofu	½ cup	_____			
____ Yogurt, plain	3.4 cup	_____			
	Total	_____	**x 300 mg**	=	**mg**

My calcium intake _____
My recommended intake _____
The difference _____